Precision SHOOTING

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The Pennsylvania State Smallbore Rifle Team fired a range scored 3984-283x score over the metallic sight Dewar course in the National Rifle Association State Team Match. Team members were: Kneeling (left to right) Martin Everitt, Etna; Victor Woomer, Tyrone; A. Kendall Johnson, Washington; Robert Moore, Claysville; Theodore Charlton, Munhall; and Charles Whipple, Somerset. Standing (left to right) Paul Frey, Glenwilliard; Allen Wilson, Shrewsbury (team coach); Loren Samsel, Sr., Dallas; Loren Samsel, Jr., Brookville; and George Handel, Pittsburgh. (Photo by A. F. Hulquist, Clarion, Pa.)

a magazine for Shooters by Shooters

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NEWS FOR HANDLOADERS

Quite recently we received a leaflet containing loading data for Speer jacketed handgun bullets for calibers .38 Special, .357 Magnum, .44 Special and .44 Magnum from Speer Products Company, P. O. Box 244, Lewiston, Idaho, These load tables include a pressure figure for each load listed in addition to the usual charge weight and velocity listing.

Of special interest is the load data for two new BALL powders developed for handgun reloading, as well as both ALCAN and HERCULES shotgun powders that were tested and found suitable for handgun loading. Sporting handgun reloaders will do well to request this new load data from the Speer Products Company.

When we all but had the contents of this issued ready for printing we received the following "News Release," which we pass along verbatim as news of general interest:

"Shooters who reload their own shotshells and handgun center fire cartridges can now obtain smokeless "BALL POWDER," according to an announcement by the Winchester-Western Division, Olin Mathieson Chemical Corporation. BALL POWDER is a registered trade-mark of Olin Mathieson.

"BALL POWDER," used for years by Winchester-Western in the loading of commercial and military ammunition, is manufactured in this country exclusively by Olin Mathieson. It is being offered to handloaders in three shotshell and two center fire pistol-revolver cartridge types, W. E. Dittman, marketing manager-ammunition, reported.

"BALL POWDER rounds out the Winchester-Western family of matched components for handloaders," Mr. Dittman pointed out. BALL POWDER is highly suited to handloading because of its stability, preventing long term deterioration, and clean burning, Mr. Dittman said. The smooth, rounded grains, carefully graphited, flow easily through powder measures, resulting in highly precise charges round after round. The powder charge settles uniformly in the shell, permitting accurate compression of charge and seating of wads.

"Smokeless BALL POWDER is made from Conventional propellent materials plus compounds which control ignition and rates of burning. The graining process forms the nitrocellulose into spheres in carefully controlled size ranges. Further processing adds material to increase potential and deterrents to modify burning rates. Rolling flattens the grains to make final adjustment for powder speed and clean burning.

"Five types of BALL POWDER are now available in canister lots for handloading. In the shotshell category, #450LS for target and standard velocity loads is available in a 12-ounce canister; #500HS for high velocity loads in 16-ounce; #540MS for magnum loads in 16-ounce. In center fire pistol and revolver powders, #230P for standard pistol and revolver loads is available in 12-ounce canisters; #295HP for magnum and heavy center fire revolver loads in 16-ounce.

"Olin Mathieson has commercially manufactured smokeless BALL POWDER since 1933. The powder was first adopted by the British government early in World War II and later by the United States for the small cartridge required by the Winchester developed U. S. Carbine, Caliber 30 M1 used in World War II.

"In a later military application, the 7.62 mm NATO cartridge, standard to United States and North Atlantic Treaty forces, was developed around BALL POWDER. Here, the powder's density, high energy characteristics and carefully controlled burning rate were determining factors," Mr. Dittman stated. Both the NATO cartridge and its sporting equivalent, the 308 Winchester, are one-half inch shorter and 10 per cent lighter than the standard 30-06 cartridge, which has comparable ballistics.

"BALL POWDER types for center fire rifle calibers are not yet available for handloaders. Research programs are underway, however, to develop canister BALL POWDERS suitable for the wide range of center fire rifle calibers which handloading requires.

"In the loading of center fire commercial ammunition, Winchester-Western utilizes many BALL POWDERS tailored specifically for optimum performance in specific calibers and bullet weights.

"The five types of shotshell and handgun center fire cartridge BALL POWDER are now available nationally in retail outlets which normally handle reloading components." (End of quote.)

The commercial ammunition loading companies seem to have surrendered to the handloaders by abandoning their former trend to discourage all handloading and adopting the adage "If you can't lick 'em, jine' em." That is just fine and we handloaders appreciate that show of good sense.

PHT

CAMP PERRY—1960

by Fred W. Hallberg

This year I permitted myself to be talked into accepting a berth on a state team going to Camp Perry. That proved a mistake. To all older shooters who do not own an M1 rifle, or if they have one with which they are not thoroughly familiar with all its pecularities, my advice is—pay your own way to Perry, bring your bolt gun, and have fun. As a state team member you must use the M1 and, if you must draw one, the chances of getting a good one are just too much of a gamble. I drew one that would not shoot and by the time Ordnance had worked it over (and they did improve it) I had developed such a frustrated inferiority complex that it became impossible to shoot at all. In my opinion, three changes would be made on the M1 immediately before the older shooter takes it to the firing line. The thin target front sight blade that comes with the National Match rifle should be exchanged for the standard thick "as issued" GI blade.Square it up, if you must, but use the thick blade. The large or medium size rear peep should be exchanged for the smallest aperture available so that dull eyes can sharply outline the front sight under the bullseye. And, last but not least, borrow the leather sling from your bolt gun and install it in place of the web sling that comes with the gun. One or two courses of fire is just not enough to get used to the web belt. To the younger and newer shooters these changes may seem very minor but each is important to the experienced precision shooter. The price of the smaller peep is less available light but the resulting sharp and clear front sight will more than offset any such disadvantage. The leather sling is also important if you have used one constantly as I have during the past forty years.

If you go to Perry with the intention of buying an M1, I would draw one for use at the matches and try to save the purchased gun for use at home. Both guns will come from the same rack. At home, I would put it through its paces and make such adjustments as might appear necessary. If, after everything that you can do, it still does not shoot, I would then send it to the folks at Fort Benning who will work over the rifle, glass bed it, test it, and return the rifle to you with a guarantee of six inch groups at 300 yards. I understand that some one in Idaho does the same kind of work for the boys on the west coast and for the same price, namely $25.00 plus shipping costs. Names and addresses have temporarily been mislaid but other shooters will undoubtedly be glad to furnish them.

The M1 rifle is quite a mechanism and it is surprising how little the average user knows about it. Judging by the appearance of the empty brass that I picked up (about 600 cases), 10% of all the brass fired at Perry had come from chambers damaged by ball powder. I gave the men from Frankfort Arsenal a handful of such cases for their examination and at this writing I still have 10 or 12 lying on the desk beside me. Because that rifle is usually cleaned and examined from the muzzle, the M1 chamber has to be pretty bad before it is noticed. Furthermore, the majority of M1 shooters are regular army, guard, or reserve military people and as such do not reload and do not look at the cases once they have been fired and ejected.

I was informed that only 10% of the 1960 registered shooters fired the bolt action rifle. That means that the competitive field for bolt action rifles has narrowed considerably and it is now that much easier to place in the bolt rifle events. I hope next year will see an increase in such shooters because valuable lessons can be learned when the results of the two weapons fired by equally skilled hands are properly compared and evaluated. We shall never know how good or how poor and troublesome the military weapon is until we take pains to compare it with a known quantity.

The food this year was excellent. Some of the meetings were very interesting and I vividly remember one at which officers from the DCM, among others, were on the platform to answer questions. I arrived just after the introductions and I do not know their names but one of the DCM people was a general (I thought I saw two stars) and the other a colonel. The general answered clearly and ably but the colonel found it impossible to answer any of the questions directed to him from the floor. Mr. Lucas of the N. R. A. acted as moderator and he impressed some of us considerably when he demanded that the DCM people answer the questions put to the platform in a manner that he, Lucas, could understand. The group in the neighborhood of my seat was sorely tempted to applaud that demand.

Commercial row was interesting as always. I don't know how profitable it was to those who displayed their wares but it was interesting to many of us and we saw and examined a lot of new equipment. Frankfort Arsenal and Springfield Arsenal shared a joint display and the men assigned to that job performed a talk marathon from morning until late at night. And last but not least let us not forget to note that the entire Perry organization was beautifully run and the organization and the men behind it deserve a great deal of credit for the job they had performed.

TOURNAMENT CIRCUIT

PENNSYLVANIA SMALLBORE RIFLE CHAMPIONSHIPS

On September 10th and 11th the Clarion Rifle and Pistol Club sponsored the Pennsylvania Smallbore Rifle Prone Championships. The four metallic sight matches for the standard 1600 point aggregate were fired on Saturday. Robert Moore, Claysville, Pa., fired a 1598-112x to win the metallic aggregate and the Oster Award. A. Kendall Johnson, Washington, Pa., was runner-up with 1596-97x.

The ten high Pennsylvania residents in the metallic sight aggregate comprised the Penna. State Team (photo on cover) which fired a range scored 3984-283x over the Dewar course in the NRA State Team Competition.

The any sight matches on Sunday were fired in a light but steady all-day rain. Charles Whipple, Somerset, Pa., won the any sight aggregate with a national record breaking 1600-147x score.

Robert Moore won the State Championship and the Hoppe Trophy with a score of 3196-247x, a mere 16x margin over A. Kendall Johnson's 3196-231x. Bob's wife, "Bertie" Moore, won the State Woman's Championship with a 3176-208X score.

Earl Miller, Glenwilliard, Pa., won the State Junior Championship and the Clarion Chamber of Commerce award with his 3174-210x score.

NEW HAMPSHIRE PISTOL CHAMPIONSHIPS

Raymond Berlo of the Boston Police beat a field of 101 shooters with a grand aggregate of 2606 in the New Hampshire State Outdoor Pistol Championship held at the Oyster River Rifle Range in Barrington over the weekend of September 10th and 11th.

Constance Rollins of Hancock, N. H., won the resident championship title with a 2476 score and was high lady. T. McLennon led the Experts with a 2540, A. McNeil the Sharpshooters with 2453, and R. Tingley the Marksman class with 2401.

The Boston Police won the center fire team match with a 1111 score and the .22 cal. team match with 1158. Hanscomb Field won the .45 cal. team match with a 1069.

Robert K. Moore, Claysville, Pa., (right), 1960 Pennsylvania Smallbore Rifle Champion; "Bertie" Moore, Claysville, Ladies' Champion; A. Kendall Johnson, Washington, 50 meter aggregate winner and runner-up in the championship.

Earl Miller, Glenwilliard Pennsylvania Junior Prone Smallbore Champion.

DAMARISCOTTA, MAINE

A total of 72 participated in the 22nd annual Labor Day Re-entry Shoot, conducted by the Lincoln County Rifle Club at Damariscotta, Maine, September 4th and 5th. John Crowley, New Haven, Conn., was the feature winner, his 500-48x score for his five best targets winning the .22 rimfire 100 yard prone match, and his 250-17x winning the 200 yard any rifle prone match. Philip McAloney, Bath, Maine, won the 100 yard .22 rimfire offhand match with 488-13x for his five best targets.

This shoot is all unlimited re-entry shooting, with five best targets counting for record score, and in case of ties the next best supporting targets deciding the tie ranking. The 100 yard rimfire matches are 10 shots on NRA decimal 100 yard targets. The 200 yard any rifle event calls for tickets of 5 shots on the decimal 100 yard target with the 100 yard target scoring.

The main event, the 100 yard .22 cal. rimfire prone match, is classified by the so-called Kennebec System, which was devised for this particular shoot at its inception many years ago. The 200 yard prone match and the 100 yard offhand match are not classified. Sixty fired in the .22 prone match, twenty-one the 200 yard prone match, and only nine in the offhand match.

A total of 33 possible 500 scores for five best targets were posted in the rimfire prone match, as against 27 who failed to make the possible score. Douglas Fuller, Woburn, Mass., was second high ranking shooter with another 500-48. He was followed by Elnor Davis, Springfield, Vt., with 500-47; W. S. Ayles, Greenville, R. I., 500-46; and Donald Winne, Albany, N. Y. with 500-46.

Douglas Fuller was also runner-up to Crowley in the 200 yard prone match, this time a point down with his 249-11x. Carl Boyington, Bangor, Me. and Robert Barker, Otis AFB, Mass., were 3rd and 4th with 249-8x each. Bernard Friesecke, Lexington, Mass., was 5th with 245-10x.

Richard Betz, Exeter, N. H., was runner-up in the offhand match with 486-17, and Wayne Higgins, No. Scituate, Mass., was third with 482-14.

CONNECTICUT INTERNATIONAL TYPE MATCHES

Both high-power and smallbore international type matches were fired at Blue Trail Range in Conn. on September 3rd. The high-power event was a course of 10 shots in each the prone, kneeling and standing positions at 200 yards range on a reduced 300 meter international traget reduced for 200 yard shooting. The total time limit for the course was 3 hours. The same course, with same time limit, was fired with

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THIS VIBRATION BUSINESS

By Jesse M. Grigg

MARK TWAIN said. "The less there is to justify a tradition, the harder it is to get rid of." To this might properly be added, the higher the authority, and the longer an established idea has endured, the harder still it is to unseat. All this means that once an idea, whether it be right or wrong, becomes established, its tenure is likely to be permanent, and this is true in all fields of human endeavor.

The barrel vibration theory is an illustration of this dictum. It has endured so long, and the notion of haphazard vibration is such a handy way of accounting for obscure phenomena that belief in it may never be shaken in the mind of the majority.

There are still other reasons why this is so. What actually happens is not apparent to the eye. Difficulties that are tremendous stand in the way of learning by other means. Worst of all, perhaps most adherents to the theory, if they speculate, reckon without taking to account the energy and physical requirements.

The fall of a firing pin communicates a jar to the rifle; but the energy involved is trifling, and its effect has no relation to what is meant by barrel vibration. Only a stress that bends the barrel transversely without compensation, and which diminishes or disappears while the bullet is in the bore can cause vibration. Before it may oscillate through 1/32 of an inch, hte muzzle must first be deflected by outside force through half that distance, this requiring that the force be possessed of the energy which would exist in the supposed vibration.

To my knowledge there are only three ways of determining the motion of a rifle barrel. The simplest consists of attaching styli to the barrel and letting it write its own record of motion, as I did 19 years ago. Another possibility is the method of photography. A third and much the most informative is the method of mathematics. With this I did a mountain of labor some years ago, calculating tentatively the motion at the muzzle of a .22 match rifle. Over the last few months I did another mountain of labor finding an easier and more practical method for the calculation.

A very simple experiment will demonstrate to the eye the kind of transverse motion that a barrel describes. Open out about five feet of a zig-zag rule and flip it with the wrist, noting what occurs in the first half of the swing. Ignore the second half because the continuity is broken by the change from acceleration to deceleration in the motion of the hand. In fact only a very small portion of the movement at the start is imitated by the barrel while the bullet is in the bore.

You will note that the first thing which happens is the formation of a bow in the rule. To form it the extreme end moves in a direction opposite to that of the rotating mean axis, as also does the mid-section in lesser degree. An instant later the rule seems to become straight and thereafter to remain so. But this is only what appears to the eye. The absolute motion of any point in the rule is the resultant of two kinds of motion whose plots, for the tip of the rule, are shown in heavy lines in Fig. 1. Here the curve (a), drawn to larger scale and shorter time, shows the detail of the motion at the start. Curve (b), drawn to much smaller scale, indicates the motion over a much longer period. In the whip of a shoulder arm only a portion of the curve in (a), owing to shortness of bore time, is imitated. Note the similarity of the start of this curve to the tracing 1-2-3 in (a) Fig. 3.

The equation for whip motion is (1) which follows. Applied to the firearm it refers, in the form shown here, to the floating barrel, and is based on condition that the stock is inflexible at the action.

$$(1) \qquad \theta = \frac{6\,aprt^2}{.00029\,I''} - \frac{1}{16}\left(1-\frac{x^4}{L^4}\right)\left(\frac{I'}{I''}\right)\left(\frac{L^2apr}{.00029\,EI}\right)\sin^2\left(12t\sqrt{\frac{EI}{L^2I'}}\right)$$

Its symbols which denote physical dimensions are used in Fig. 2. L denotes the bending length, measured between the muzzle and the receiver junction; x, referring to any chosen point in L, is measured from the muzzle end; s is the distance from the fixed end of L to a perpendicular through the pivot point O at the shoulder. The radius arm is r, this being the distance from the bore axis to a horizontal through O. The product of r and the force eexrted on the bolt face is the turning moment about O.

If O is fixed, and deflections do not differ sensibly from arcs, the equation for absolute angle turned through by any particular tangent to the bore axis is

All quantities are to be substituted in inch-pound-second units, including g=32.16 times 12. P denotes the average bore pressure on the bolt face, this equaling twice the muzzle energy divided by the volume of the bore. Symbols a and t denote respectively bore area and bore time. E is the modulus of elasticity of the barrel material, and I is the plane moment of inertia of the barrel section. I' is the moment of inertia of the barrel L referred to the receiver junction, and I" is the moment of inertia of the whole rifle referred to O.

The first term in this equation gives the minutes of angle turned through by the whole rifle in rotation about O as a pivot point. The second gives the minutes of angle turned through by a tangent to the bore axis at any distance x, measured backward from the muzzle. The difference between the two terms is the absolute angle turned through by the tangent to the bore axis. If zero is put for x, the muzzle is referred to; if the bore axis was horizontal at the start, the difference between the two terms equals also the direction of muzzle point at time of bullet emergence, and thus equals the direction of bullet emergence.

The difference between the angle of bullet departure and the initial direction of muzzle point is called the jump or flip, according to whether the muzzle points upward or downward. If the first term in Eq. (1) is greater than the second, the difference is positive, the barrel slopes upward at the muzzle, and the difference between the two terms is called "jump"; if the second term is the larger of the two the difference is negative, the barrel slants downward, and the angle is called "flip." These definitions refer only to change of angle at the muzzle, and in no manner whatsoever refer to the visible throw of the rifle. In both cases the visible throw is upward; but compensation for flip requires elevation of the rear sight, and jump requires depression of it.

Eq. (1) is versatile. Integrated once between limits with respect to x it yields deflections in inches instead of minutes of angle. In inches, it permits the curve of the barrel to be plotted. By equating to 2 Pi the angle in the sine-squared factor, the resulting expression yields to within 1.5 per cent for the barrel what would be its free vibration period and frequency in the fundamental mode.

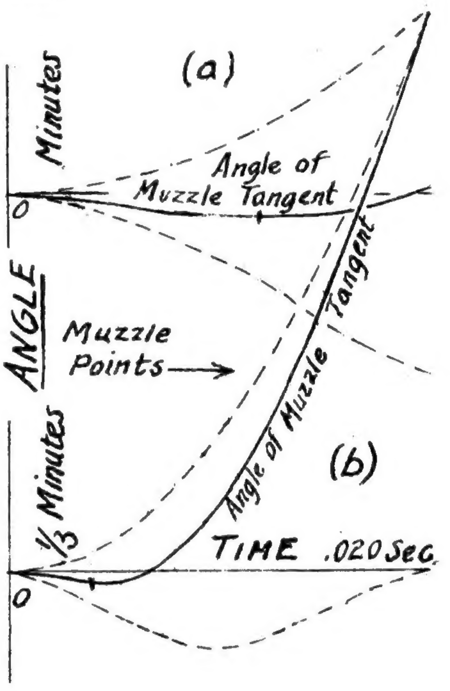

FIG. 1

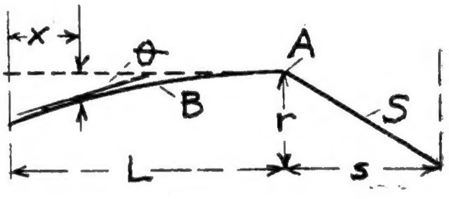

FIG. 2

Chosen for illustration of values yielded by Eq. (1) are figures for the Win. 52-C H. B. match rifle. The moment arm r, according to wear on the rubber buttplate, is assumed to equal 1¾ inches. The calculated average pressure on the bolt face for the 1145 velocity is 2626 p.s.i. When the bullet emerges the rifle itself has rotated upward through 3.633 minutes. Relative to this, the bore axis at the muzzle has turned downward 4.694 minutes. The difference 3.633 minus 4.694 equals 1.061 which, being minus, is flip. If the figure 3.633 for throw seems small, consider that it corresponds to motion of a ball before it leaves the pitcher's hand.

For 50 yards the measured difference between sight heights is ⅛" minus a few thousandths. Calculation with trajectory minutes, sight radius, and height above bore yields 1.44 mechanical minutes for flip, this figure being too large by an amount equal to the error in measurements. Perhaps the actual discrepancy between the mechanical and the theoretical flip amounts to not more than one click. This is for a barrel in a stock more sturdy than the factory stock.

To satisfy curiosity about the relative stiffness between the forestock and the barrel, I clamped them alternately in a vise with the rifle assembled, and determined the forces needed to cause equal separations at the tip of the forestock by reading the pulls on a spring balance. For equal moment arms ahead of the receiver screw it was found that the barrel is 2.4 times as stiff as the forestock.

With the bedder engaged this rifle shoots from ¼ to ½ a minute **lower** than it shoots with the barrel full floating. That it shoots lower seems at first to be an anomaly, but a little thought supplies the explanation. When the barrel is floating the muzzle dips lower, but the curve is not as sharp as the curve of the barrel bended over the bedder contact as a fulcrum. Thus the bullet leaves at a flatter angle. In this connection it is interesting to note that the less than ½ minute of angle difference is about 10 per cent of the total lag, this fact indicating that Eq. (1) is reasonably suitable also for the barrel with forestock support at the usual distance.

A further discussion of the nature of whip must, for clearness and understanding, be preceded by enumeration of the various conditions under which whip occurs. In general, these are three in number. The first is the case of the floating barrel in a stock that is inflexible at the receiver. This is the case to which the above equation refers, and examples may include the rifle whose forestock supports or is attached to the barrel at moderate distance ahead of the receiver. In this case the barrel is cupped downward in whip, and likely it will be flip that is registered on the target.

In the next case the barrel is attached to or is supported by the forestock, but with this difference that the place of contach is near the muzzle. The military arm is the best known example. If the forestock is stiff enough and the contact is far enough out, the barrel will be cupped upward in whip, and jump may be registered.

The third case is the one in which there is a yielding weakness in the vicinity of the action. Yielding may be due either to insufficient stiffness of wood, due to a loose barrel thread, to looseness in a take-down assembly, or looseness in a stock through bolt. If there is much flexibility, it may have a dominating effect on the whip, regardless of how the rifle is otherwise constructed. The bending curve will be compounded of the effects of two opposing torques, as is to be explained in proper place.

Consider now, for the first group named above, the effects of variation in the factors which regulate the flip of a floating barrel. First of all, for rifles approximately alike in weight and proportion, the flip will be proportional to the product of bore area, pressure on the bolt face, and the moment arm r. Variation in the placement or pressure of the buttstock on the shoulder, by varying the effect of r, will vary both the throw and the flip. As I well remember, this is something that I, as a youth, had to learn through failure. After advancing from short stock .22 plinking rifles to 32-40, my ability to hit was just about nil until I discovered that the buttstock must be pressed firmly against the shoulder.

The size of the angle whose sine is squared in Eq. (1) is intimately related to the characteristics of the firearm. The smaller it is, the less of the curve in Fig. 1 that is imitated before the bullet leaves the bore. In the example of the match rifle shown above, this angle is suitably small, it being only 38° 4′.

The size of this angle depends on the numerical value of the quantity whose sine is taken in Eq. (1). If the numerical value is small enough, as it is in the example employed, for the sine to equal or approximate the angle itself (in radians), then the value of Eq. (1) is independent of the sine-squared factor. Therefore, after factoring like quantities out of the two terms, it is found that the flip is proportional to P(t squared)/1″.

First of all, the larger I″ the smaller the flip, and therefore the smaller the error if the flip varies. I″ is the moment of inertia of the rifle about O. It increases with rifle weight, but has its greatest value per unit of weight, if the weight is concentrated in the barrel.

Further, for the same weight of bullet, increasing the average pressure on the bolt face will diminish the bore time in the same proportion. Thus for the same bullet weight, t is inversely proportional to P. Substituting 1/(P squared) for (t squared) shows that, for the same bullet weight, the flip is proportional to 1/PI″. This is to say that increasing the charge with the same bullet weight will raise the point of impact by diminishing the flip. However, it is pointed out that this statement applies only for the rigid stock. If there is flexibility at the receiver, buckling may occur, and the reverse be found true, i. e. that increasing the charge lowers the point of impact. In either event, increasing the muzzle energy irrespective of bullet wegiht, likely will have the same effect that is caused by increasing the charge.

The case of the barrel which is supported by the forestock out near the muzzle is now called to the attention. The example of course is the barrel in a Mannlicher or a military stock. Dynamically, it differs from the short stock rifle by having more of inertial thrust exerted between the receiver and the stock support than is exerted beyond the support. If the forestock is stiff enough, the whipped barrel will be cupped upward instead of downward. If upward, jump is likely to be registered, else the result will be less of flip than would be registered by a rifle that is similar in other respects.

For the barrel curve to be cupped upward, the moment of the reaction at the contact must at least equal the opposing moment of inertial force that is exerted by the barrel, less the moment of the bend in the barrel. This condition is not impossible of realization. The combination of two inflection points in the cupped up barrel tends to relieve the downward pressure on the stock support; further, as the sign is opposed to that of the inertial downthrust, the difference between them may be small enough, compared with the reaction at the support, for the state of upward cupping to be favored. Whether this result actually occurs depends on the power of the load. Thus as a cupped up barrel is required for jump, on the power of the load may depend whether such a rifle jumps or flips.

The foregoing statement that a cupped up barrel is required for jump applies principally to the shoulder arm. A pistol jumps, but it does so because its characteristics differ greatly from those of the rifle. They are such, owing to shortness of barrel and paucity of weight, that the angle in the sine-squared is quite large, with result that the difference between the terms of Eq. (1) is positive. For this reason it is almost a dead certainty that the pistol will jump.

The case of the rifle that is flexible at the action or receiver is divisible into two groups. In one, as has been stated, the fault is outright loosenses, such as may exist in the two-piece stock rifle. In the other the fault is an insufficiency of wood at the receiver cutaway. In the first named fault the looseness may be expected to yield suddenly, and almost without resistance. In the second the wood yields gradually until its resistance equals the stress which taxes it.

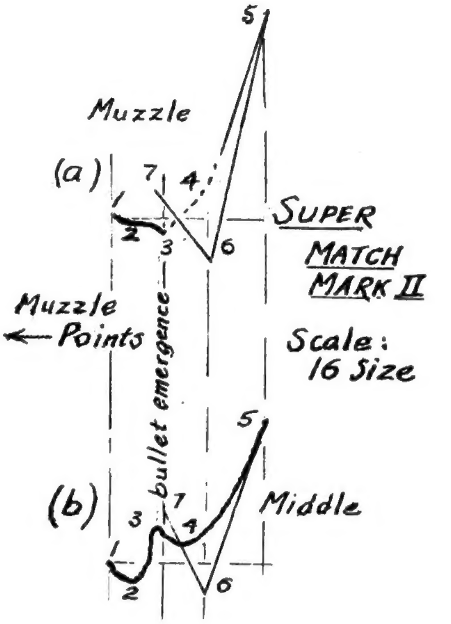

FIG. 3

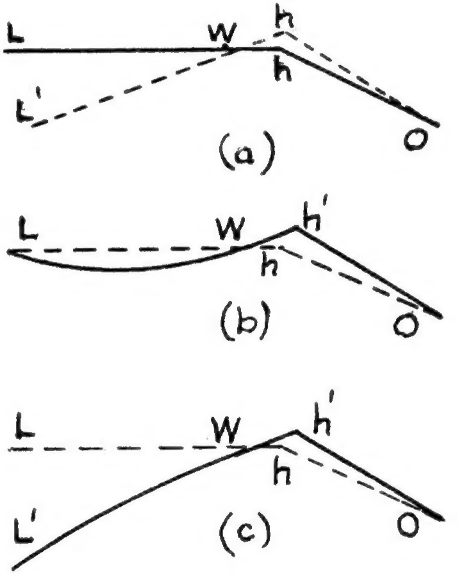

FIG. 4

Fig. 3 is an amplified recording of barrel motion which shows clearly the effect of looseness at the action. The curves were traced 19 years ago by the barrel of a .22 Marlin lever action by means of a stylus which was attached to the muzzle and the mid-section in turn. The Marlin had been chosen for the test, not only because its forestock and magazine tube could be taken off for attachment of the stylus holder, but also because the light barrel would yield tracings coarse enough to be legible under a glass.

The upper curve in this figure agrees with the curves in Fig. 1 only in the part which refers to motion before the bullet emerges. After emergence occurs the movement of the rifle is the result of momentum plus reaction of the shooter's muscles and apparel. The curve in Fig. 1 assumes for the purpose of theoretical illustration that the thrust of the average bore pressure has been maintained over a much longer interval than normal bore

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This Vibration Business

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time. Actual bore time is indicated by a mark on each curve.

In Fig. 3 the striking feature is the cusp in the curve 1-2-3 of (b) which was traced in the fore stage of bullet travel. It is striking because one would suppose that the mid-section of the barrel would trace a curve whose ordinates were higher than those traced by the muzzle. That the curve dips downward, one may only conclude that it was the result, either of looseness in the takedown joint, or in the junction of the tangs and the buttstock.

The following analysis of a behavior which is due to a flexible stock will show that this cusp is a natural phenomenon.

In Fig. 4 the flexibility of the stock and the action is assumed to be concentrated at h, where the line Lh of the bore axis joins the axis hO of the stock. In effect the junction h is a hinge. W is the center of gravity of the rifle as a whole, and in general it is situated ahead of the hinge. O, assumed to be fixed, is the place where the recoil thrust is stopped.

When the rifle is fired the thrust of recoil tends to drive W straight back; but, owing to the hinge at h, the linkage of straight lines buckles, tending to assume the position shown by the broken lines in (a). Both lines would still be straight as shown if the barrel were inflexible.

The buckling involves two different angular motions, one opposed to the other. In one the whole system tends to rotate upward about O as a center; in the other the barrel tends to rotate downward about h as a center. As long as h is yielding the downward rotation is the ruling one, this because Lh is less than LhO.

Meanwhile, if the hinge at h yields without resistance ,as it would do in the case of a loose barrel thread, or a loose takedown joint, then the downward torque on the barrel comes with all the violence of suddenness. As the barrel is flexible, a curve which starts at the receiver is formed in the barrel and increased as long as h is yielding. Its cup faces upward as is shown by the curve 1-2-3 in (b) of Fig. 3, and by the curve LW in (b) of Fgi. 4.

Presently, when the hinge ceases to yield, the whole system proceeds to rotate upward about O as a center, this undoing the initial kink, and tending, insofar as remaining time permits, to put a normal bend in the barrel. A normal bend is one which is cupped downward. By comparing (a) and (b) in Fig. 3 it is seen that the barrel actually is cupped downward at the time of bullet emergence; for the mid-section is higher than the muzzle. Thus the bore axis at the muzzle slopes downward, and the rifle assembled registers flip—about six minutes according to my recollection.

If instead of outright looseness at the receiver, there is only an elastic yielding of the cutaway stock, then reverse bending proceeds only until the restoring force in the wood equals the torque. This comes about gradually; but, owing to the restoring force in the reverse barrel curve, the barrel, at time of bullet emergence, may have in it an abnormal downward bend, and register a corresponding excess of flip.

In most designs of the bolt action rifle the stiffness at the action depends to a large extent on the stiffness of the receiver which bridges the cutaway. Owing to cuts in it, the receiver itself, however, possibly is no stiffer than the adjoining barrel at the junction; but if the receiver is assumed in the matter of stiffness to be a continuation of the barrel, the contribution of attachment to the stock at its forward end is of far less import than the contribution of attachment to the stock at its rear end. The effective stiffness at the rear end depends greatly on the lengths of bearing surface, fore and aft of the receiver screw. This is borne out in the use of glass bedding, whose principal advantage is the characteristic of additional stiffness at the receiver. Also stiffness at the receiver is a characteristic of the Springfield '03 and related designs, in which the use of three receiver screws makes the most of both the stiffness of the wood and of the metal assembly by combining their sections into a boxlike structure.

Finally, as definite figures have been shown only for the .22 rimfire, a question may now be raised about the applicability of the argument to higher power. This question may be answered with the equation that has been shown. Likewise the barrel will whip, and the relation between throw and bend will be regulated by the angle in the sine-squared. Being proportional inversely to muzzle velocity, and also to a quotient which very nearly equals the barrel diameter divided by the square of barrel length, this angle, if it differs from that for the .22 rimfire, is likely to differ on the favorable side. Throw and bend may be ten times or more as large; yet, because the angle in the sine-squared is the controlling factor, the motion necessarily is whip.

If all this is not enough to refute the notion of haphazard vibration, then look at the matter from the standpoint of bore time and vibration period. The natural frequency of the .22 match barrel used for example is very nearly 26 cycles per second in the fundamental mode; at this rate the period of one cycle is .0383 seconds. The bore time is about .004 seconds—roughly **one-tenth** of the time which this barrel would need for one complete oscillation. For a light barrel in the .30'06 class, perhaps calculation would yield a somewhat longer period for one oscillation; and, worse yet for the case of haphazard vibration, the bore time might be from ⅓ to ½ as much, depending on the rifle and load. So what goes for the .22 rimfire goes in stronger terms for higher power.

Now it has been stated as incontrovertible fact that the bore time is only a small fraction of the vibration period. As the amplitude of the vibration must start at zero, the notion of a bullet emerging at the end of a swing must first of all be ruled out. Further, as the direction of the first transverse motion of a barrel is fixed because the direction of the causative force is always the same, the notion of bullet emergence in opposite phases must also be ruled out. For these two sufficient reasons the notion of a bullet emerging at either one side or the other of an oscillation is unthinkable. Even if there were no other reason, for these two alone the commonly accepted notion of barrel vibration is untenable.

Pursuing still farther, I much doubt that the barrel vibrates even when the bullet is gone. Remove a barrel from a receiver, and it will ring like a bell when struck, but attached to the receiver it yields only a metallic clink. The reason is this: The receiver has not enough mass to permit what is called fixed-free vibration, yet has too much to permit free-free vibration. The obstacles to vibration in the assembled rifle are still greater. If the barrel vibrates then, it must be a sort of tail wagging the dog affair.

The vibration theory has not a leg to stand on; but because it is established, the favor it has today will endure tomorrow, and through days to come.

Tournament Circuit

(Continued from Page Three)

smallbore rifles at 50 meters on the international 50 meter target. Thirty-five competed in the high power matches and 16 in the smallbore matches.

The five high in each stage and aggregate of the high power section were:

Prone—Bud Ebdon 189-3, Bill Learned 186-5, Dr. J. B. Wager 185-6, Frank Williams 185-4, and M. Kinczyk 185-3.

Kneeling—Peter Tierney 169, Bud Ebdon 167-3, Bill Learned 165, M. Kinczyk 160, and Fred LaBarre 156.

Standing—Don Bush 171-2, Ed. Condon 149, Pat Carey 146, M. Kinczyk 145, and Bob Carey 143.

Aggregate—Don Bush 506-5, M. Kinczyk 490-4, Bill Learned 489-6, Bud Ebdon 487-6, and Peter Tierney 486-3.

The three high in each stage and aggregate with smallbore were:

Prone—H. V. Heidrich 192-1, J. H. Ring 190-1, E. J. Condon 189-5.

Kneeling—H. V. Heidrich 183-3, J. H. Ring 176, Peter Tierney 171-1.

Standing—J. H. Ring 164, H. V. Heidrich 156, Peter Tierney 154.

Aggregate—H. V. Heidrich 531-4, J. H. Ring 530-1, Peter Tierney 512-5.

NEW JERSEY SMALLBORE LEAGUE

Madison Rifle Club was unbeaten in the 12 match schedule of the 7 team Union County Rifle League. Perth Amboy with 8 wins and 4 losses was runner-up and Union County with 7 wins and 5 losses was third. Madison fired three "possible" team scores during the season.

High individual averages were: Ransford Triggs 100.0, Fred Triggs 99.9, and L. Larson 99.8.

OHIO SMALLBORE RIFLE LEAGUE

The Richland Gasco Rifle and Pistol Club of Mansfield, Ohio, made a clean-sweep win in the four team North Central Ohio Rifle League summer schedule. Galion was in second place, Ashland third and Shelby at the bottom. All matches were fired on the Ashland Club's range.

CONNECTICUT BIG BORE RIFLE LEAGUE

Only two points separated fourth from first place teams in the September 11th match of the Connecticut Big Bore Rifle League. Rippowam, the league leaders who have been beaten by only one team so far this season, were the winners with a score of 610-54V (possible score of 625). Quinnipiac and Bell City were second and third, each with a 609-37V tally. Springfield (Mass.) was fourth with 608-29V.

Some 300 individuals shooting for 43 teams participated in the match.

1960 CONNECTICUT STATE SMALLBORE CHAMPION

Carl Johnson, who has been refusing to shoot iron sight smallbore matches, was persuaded by his father, Eric, to shoot the full course at the Connecticut State Championship Matches, September 18th. Carl won the championship with a good score, including a 400-33x iron sight 100 yard score.

LETTERS

A BARREL VIBRATION EXPERIMENT

Dear Mr. Teachout:

I am writing this letter in hopes of trying to eliminate some of the confusion and conjecture concerning barrel vibrations.

Allow me to list a few simple facts about mechanical vibrations using rifle barrels as an example.

1. The barrel will vibrate whether or not there is a strain on it. A barrel under longitudinal strain would vibrate at a slightly higher resonant frequency such as a piano wire when it is stretched. This longitudinal strain caused by the bullet friction on the barrel is so slight that for all practical purposes it can be forgotten.
2. The barrel will vibrate at a given frequency known as its resonant frequency. This frequency can be altered by such things as bedding, heavy bullets, muzzle brakes, scopes on the barrel, etc.
3. The resonant frequency will remain the same under the same set of circumstances, but the amplitude of the vibration cycle can change as a function of bullet weight, powder weight, and rate of burning. The position of the nodes will also remain pretty much the same.
4. Rifle barrels will vibrate at their resonant frequency as soon as enough energy is imparted to them. It is reasonable to assume this happens as soon as the bullet enters the lands.

I know it is easy to state such things but quite another thing to be able to prove them experimentally. I am quite fortunate, however, to be able to perform many experiments in the field of gun barrel vibrations. I would like to take this opportunity to report the results of the first of several experiments dealing with gun barrel vibrations.

This first experiment involved just a single rifle barrel without an action or stock. The barrel used for the test was an issue 8 mm Mauser barrel cut down to sporter size. The dimensions of the barrel are: length, 21⅞ inches; diameter at breech, 1 1/16 inches; diameter at muzzle, ½ inch. The steps had been turned off and left a reasonably smooth taper.

The purpose of this test was to find the resonant frequency, the amplitude, and the node points of this barrel. After these were found it was then desired to find the influence a bullet travelling down the barrel would have in altering things.

The main piece of equipment used in the test was a Lessells and Associates "Vibar" electromagnetic vibration fatique machine. The barrel rests on its two nodal points which are easy to find on this machine. An accelorometer is fastened to the tip of the muzzle. An electromagnet is placed under each end of the barrel. When the power is turned on, the electromagnets turn off and on at high frequencies thus making the ends of the barrel vibrate up and down. The barrel will vibrate at its natural resonant frequency. The frequency is fed into the machine by the accelorometer which is fastened to the muzzle. This in turn regulates the frequency of the electromagnets to the resonant frequency of the barrel. After a very short time the machine continues to operate the electromagnets to the resonant frequency of the barrel. At this point the power can be regulated to increase or decrease the amplitude of vibration, but nothing can change the frequency. The two rests that the barrel sits on can now be adjusted to the node points which can be easily seen or felt. The power to the electromagnets can be raised to increase the amplitude to the point where the barrel will break in a very few minutes of running.

The "Vibar" was operated at a medium power factor and that power factor was maintained throughout the entire test. The following results were obtained. The antinodes occurred 4 3/16 in. from the breech end of the barrel and 4¾ in. from the muzzle end of the barrel. The amplitude at the muzzle measured with an optical scale was .022 in. from top to bottom of the cycle. The natural resonant frequency of the barrel was 248.1 cycles per second.

As I mentioned above, the bullet travelling down the barrel could change the frequency and the amplitude. This is due to the added weight of the bullet and the moving center of mass as the bullet travels down the length of the barrel. To see how this variable in the system affected the frequency, amplitude, and the nodes, an additional experiment was done. A 210 gr. lead bullet was pushed into the barrel from chamber to muzzle and readings were taken of amplitude, frequency, and nodal position with the bullet in six different places in the barrel. Following are the results:

Bullet distance from chamber end of barrel	No bullet	3"	5"	10.5"	13.5"	16.5"	* 20.625"
Node distance from chamber	4 3/16"	4 3/16"	4 3/16"	4 3/16"	4 3/16"	4 3/16"	4 3/16"
Node distance from muzzle	4 3/4"	4 3/4"	4 3/4"	4 3/4"	4 15/16"	4 3/4"	4 13/16"
Amplitude at muzzle	.022"	.035"	.030"	.035"	.035"	.032"	.040"
Frequency in cycles/seconds	248.1	247.8	247.5	245.1	246.3	247.8	240.8

*½ of bullet protruding from muzzle.

A close study of the table shows that the only significant difference occurred in the muzzle amplitude, especially when the bullet was protruding from the muzzle. The frequency dropped very slightly when the bullet was placed in the barrel and this is as it should be. Any mass added to the system would tend to lower the frequency especially such an added weight as a target telescope on the barrel.

It must be kept in mind that the barrel used in this test would be classed as lightweight and the bullet as heavy. It would be safe to assume that in the case of a heavy target barrel using light bullets under 100 grains, that almost no measurable changes would result when subjected to the same test.

It should be noted that I draw very few conclusions from this experiment. I merely tried to prove experimentally, a few facts about mechanical vibrations that are well known to engineers in the field of vibrations. I realize that many conclusions will be drawn from this experiment by the many so-called, self-appointed experts who publish volumes of misleading and opinionated information in the popular gun periodicals. Many readers are unduly influenced by unusual and oddball opinions, so I would like to interject a word of caution. One carefully controlled test is worth a thousand opinions.

This work so far has been done only on a barrel in the so-called free free position. There is some reason to believe that something close to a free free position exists for a stocked, barreled action. The next test in this series I hope to conduct is to vibrate a barreled stocked action. In this test, I am going to vibrate the muzzle end of the barrel only using one electromagnet. Ultimately, I would like to put electrical resistance strain gages on the barrel and measure the vibration of the barrel as a bullet is fired through it. I can obtain photographic readings of the vibration signal from an oscilloscope. This type of strain gage vibration study of gun barrels is not new. The practical end of this test program will be in trying to find a one best method of barrel bedding. From now on, my tests will include different types of bedding systems. I would like to find why and how different bedding systems work. At the present time, barrel beddings can be generally classified in two groups; those that control vibrations, and those that dampen vibrations. What the final result will be is anybody's guess at this time.

The remainder of the testing will have to wait awhile. I have to get a spare Mauser receiver and issue stock, and of course, some free time as well as extra cash for the strain gages, ammo, etc. that will be needed. Phil, I certainly hope this letter has been able to, in some little way, clear up some of the mystery of barrel vibration.

Sincerely yours,
Bernard P. Friesecke
Lexington, Mass.

(Editor's note: Mr. Friesecke is a competitive shooter with hi-power, smallbore, and shotgun, and has done some bench rest shooting. His profession is aeronautical engineering and his present work is in the filed of stress analysis and vibration fatigue of metals.)

MORE ON HANDGUN BULLETS

Dear Mr. Teachout:

My August issue came yesterday and there is Mason Williams with his rather immediate answer to some of your queries concerning this target business and swaged bullets in handguns. He states the matter well when he says that swaged, jacketed handgun bullets are for long range, hi-velocity varmint and hunting use. I have found this to be true in all that I have done with such bullets.

However, Williams overlooks the matter of the "status quo" in the handgun world. No one shoots handguns at 100, 200 and 300 yards in matches down in this part of the world and I doubt seriously if any one does so up in your section. Pistol and/or revolver match shooting has gotten pretty well standardized over the past twenty-five to fitfy years and there is little likelihood it will change much toward this long range sort of thing.

You know, and I know, and Mason Williams knows that handgun target shooting on an organized basis is not a long range affair. It takes place at 25 and 50 yards, except in International type matches, where the distance is in meters and the longest distance is 50 meters for the handgun.

(Continued on Page Eight)

Letters

(Continued from Page Seven)

So, with it a well established fact that handgun shooting is going to be conducted under the NRA, and probably similar rules of the USRA, why get upset over figuring out match ammo for handguns at 100, 200 and 300 yards?

I have always been a great admirer of Elmer Keith. Matter of fact, we stopped to see him this summer, while out in Idaho. Elmer has written many articles about "Hunting With The Handgun," but I am sure that he will not recommend it as the sole arm to use while one is hunting, except possibly for jack rabbits and such varmint type animals. Elmer looks on the handgun, I feel sure, as an auxiliary sort of arm for the hunter, when going after big game, and not the primary arm for such game.

The old saying about "Do not send a boy to do a man's job" still has a lot of extra good common sense in it when applied to handguns. They were not built for long range work in the first place. They are and always will be an auxiliary weapon, no matter how you care to argue around the point.

I have shot handguns for a long time, starting about 1932 in a serious manner. The first good, heavy caliber revolver I ever owned was the S&W .38/44 Outdoorsman with 6½" barrel which I bought new in 1934. Up to that time I had been using a K-22, which I bought in 1933, and an odd assortment of other .22 and center fire guns before that.

I still have this fine S&W .38/44 and it has been fired over 125,000 rounds, and still looks like a new gun. I took it back to the S&W factory with me in 1946 and they inspected the gun when it had fired somewhat over 100,000 rounds and found little sign of wear. Other guns that I own have been fired from 25,000 to 75,000 rounds. I just cite this to show that I have shot a lot of handgun ammo. I have done lots and lots of reloading, in order to shoot this many rounds.

I have shot everything that would melt and make a moulded bullet, including zinc. I have used pure tire weights, pure battery terminals, pure type metal, and every other assortment known to man that you can heat on the kitchen stove, pour with a lead ladle and come up with a reasonable facsimile of a moulded bullet.

Since January 1957 I have been swaging handgun bullets. I originally bought Lakeville Ejection type swaging set-ups for .357, .429 and .454 size bullets and tried out the zinc base type bullets that Lakeville got its start with. I found them unsatisfactory for my work.

Swaged jacketed bullets are fine—for hunting small game, varmints and the like at normal distances. In this day and time, with the so-called population explosion, it is not well to have bullets that go ricochetting all over the landscape, and that is just what the swaged jacketed bullets will do if you blast them off at distances like 100, 200 and 300 yards at game.

Mrs. Remmel and I are former tournament pistol competitors. We started in right after World War II in 1946 and went at it pretty hard and fast from then up through 1951. We traveled the "grapefruit circuit" from Tampa, Miami and Jacksonville right on across the southern USA to Calexico, California. We have associated with all the leading pistol shooters of the USA, both past and present. During 1948, 1949 and 1950 I was a member of the NRA Advisory Board for the pistol. With the exception of higher scores, more training, somewhat better guns and allied equipment, target handgun shooting done today is no different than it was during 1946 to 1951, when I was active in it.

If you will read the excellent statistical article in the March 1959 issue of the AMERICAN RIFLEMAN on page 41, you will see that the handgun target shooters of the USA use a pretty well cut and dried type of handload. In looking this list of statistics over, you will find the preponderance of the H&G #50 bullet in the .38 Special and the H&G #68 bullet in the .45 (either flat or bevel base).

For some reason or other George Hensley came up with the "right" design, when he designed the #50 Wadcutter bullet back in the early '30's, for that is when this bullet first came into use. I was using it when I was learning how to shoot that .38/44 Outdoorsman I spoke of earlier.

Handgun shooters who go in for target shooting use **low velocity loads,** as the article in the AMERICAN RIFLEMAN, noted above, will show you. The usual load for the .38 Special is 2.5 to 2.7 grains of Bullseye. In the .45 ACP it is from 2.8 on up to 3.5 grains of Bullseye. This is what is presently referred to amongst the target pistol people as SOFTBALL ammunition. HARDBALL ammunition is full jacketed, full charge loads, mostly for the .45 ACP and the only ammunition allowed in the National Individual Pistol Match at Camp Perry, and in those other matches over the USA during the year, where one can win a "leg" toward the Distinguished Pistol Medal.

I have a Potter machine rest, which is supposedly out of date now that we have all the others that are supposed to be so much better. However, I have modified my Potter somewhat and when it will shoot under **one half inch** groups with the S&W M41 .22 auto and even shoot an occasional ⅜" group with the same gun, I feel that it will do a fair job of comparing good target loadings in the .38 Special and the .45 ACP. You will note that I state the modified Potter of mine will do just as well with "good target loadings." It has always done better with target loadings than with hi-speed loadings and I feel certain that other machine rests will do the same.

All my bench rest testing with the handgun is done at 50 yards. My Potter rest is anchored securely and cannot move. Firing is done at that time of the day when all weather conditions are optimum. Temperatures are usually constant and from 60 to 70 degrees. Ammo is all freshly loaded and carefully assembled.

Now I have come to an important section relative to making **good** moulded bullets for target shooting. I use, **for most all bullets that do not require a gas-check,** the Star lubricator and sizer. Here is the important thing in good bullets for target shooting.

From talking with many handloaders, I have found that most all of them use either a Lyman or the Cramer (now made by SAECO). These are very good sizers and lubers, but they cannot do the job on target bullets that the STAR can and for this simple reason; namely, the STAR is A SWAGE TYPE SIZER and all it does is push the bullet straight through and swage it to size, and at the same time apply the lubricant.

Bullets go STRAIGHT through the STAR, and there is no chance for them to tip, or to have more lead removed from one side than the other. It is hard to apply gas-checks with the STAR, due to this straight through feature, but it was not made for and not intended for use as a gas-checking luber. One **can** apply gas-checks with the STAR, but there is no need in ruining the dies with gas-checks and it is much cheaper in the long run to just buy a Lyman for that purpose, and that is what I do.

If you will use either a two or a four cavity H&G mould and mould carefully, using one of the SAECO type bottom feed pots, you can get just as uniform bullets as with swaging. To be sure, you now and then get a bullet with an air hole in it. But, if you will visually inspect the moulded bullets while they are still new and shiny, you can spot most of the air holes, as they show on the bottom with a different "sheen" than the rest of the bullet metal.

My practice is to weigh all bullets finally passed by my visual inspection. The H&G #50 bullet will weigh from 144 to 147 grains, when cast properly. This 3 grain differential is due to the manner in which the bullet alloy works in any given batch. All bullets falling below 144 grains are thrown out due to the possibility of an air hole that cannot be detected by the visual examination. You are not apt to run over 147 grains, for that is all the bullet can weigh if you use a mix of 15 parts lead and 1 part lead (with my mould, that is all it can weigh with that mix).

When one has moulded his bullets carefully, visually inspected them, thrown out all questionable ones and then weighed them, he can be assured of one thing. These bullets will stay in the X-ring of the Standard American Pistol Target at 50 yards, if everything else in the loading operation is performed as carefully as the bullets have been made.

The X-ring of the Standard Americna pistol target measures 1 and 11/16 inch in diameter (plus a very few thousandths). Factory ammo **will** stay inside this circle. I use Western Super Match as my "Norm" against which I check handloads. I shoot a group at 50 yards with the Western Super Match and then shoot the handload in the same gun to show its capabilities. I can consistently load moulded, lubed and sized H&G #50 bullets so they will shoot as well and in most cases better than the factory loads.

Unlubricated soft lead bullets that are either gas-checked with the usual type gas-check, or zinc based, and driven at extreme velocities will cause all sorts of pressure troubles. Elmer Keith in his early book, SIX GUN CARTRIDGES AND LOADS," written way back in 1936, warns about using soft lead bullets with too much bearing surface on the barrel **AND** too little lubrication. He states that such bullets will increase pressures tremendously, and that is as true now as it was then.

Someone will bring up the powder controversy now. Keith had #2400 in 1936, just the same as we have it today, with very minor variations. Lead is just the same today as it was then and handgun barrels are no smoother or rougher today than in 1936. It is only the peculiarities of men's minds that change and in many cases forget things that have been done before.

In the July issue of GUNS & AMMO there is an article on the present rash of blown up guns. On page 65 there is shown a revolver that was blown up with "excessive over-loads and **overly soft** bullets." Had these overly soft bullets been kept to a minimum size of not over 140-150 grains weight, it would have taken a terrific over-load to blow the gun. But, I would imagine that the bullets were, like the loads, quite a bit over their proper weight.

This is a feature about the new swaged, jacketed bullet "kick" that everyone is now on that does not seem to have been stressed at all in the ads for the various swaging devices, and more needs to be said about it. In the C-H Swagomatic ads, they show .358 bullets in all shapes and sizes, and some of them with **excessive** barrel bearing surface above the half-jacket. This is very bad, for this bullet had no lubricant, is made of soft, pure lead and will upset into the lands and grooves and thereby cause terrifically excessive pressures. I do not think this is right and this should be warned against by all the makers of swaging devices for handgun bullets.

I feel the question of whether a bullet should be crimped or not, as you argue with Williams' letter in the August issue, is a purely academic thing. **ALL** half-jacket, swaged bullets should have the jackets crimped on. Lakeville Arms makes a most excellent little tool for doing this and it should be a must for all shooters using or making swaged pistol bullets; just so they can keep those jackets with the core 100% of the time. A stuck jacket in the bore will surely ruin an otherwise fine barrel and may possibly do harm to the shooter.

Sincerely,
Harmon L. Remmel
Fayetteville, Arkansas

BENEFITS FROM ATTENDING MATCHES

Dear Phil:

Last year at this time when I returned from Johnstown, I wanted to write to tell you how much I enjoyed going to that bench rest meet, alhtough as a non-contestant. I kept putting it off till it was too late, but this year I resolved to write at the first opportunity. My purpose is to urge other non-contestants to go to the nearest bench rest match and see for themselves how much fun they can get out of it. They will be able to see and talk with some of the nicest and most talented persons in the shooting game, and observe the guns and equipment they have been reading about.

My wife and I have gone to several matches at Johnstown and a couple at DuBois. I think she enjoys them nearly as much as I do. This year, in response to the Home Coming Banquet Invitation, we started out on Friday morning. I have been planning a 22RF Ballard target rifle for two or three years, and with a suitable action, stopped in to see M. S. Risley. After the pleasant experience of talking with him and seeing his guns, we journeyed on to Johnstown. Our favorite stopping place was not available so we stayed at one of the several tourists homes for the two nights we were there.

After a good hearty breakfast in the local diner with two others, one an old bullet making friend and the other a new young friend, we went to the Pine Tree Range. There, while I browsed, my good wife read, took a few pictures, or napped in the car.

And this is the part I like best. I talked with many shooters and others about guns, bullets, and equipment. Some of the problems or ideas I have been wrestling with in my mind, I was able to understand better or solve. For instance, I found that cast zinc based bullets are not accurate as I had been finding out for myself by shooting them in both a .38 Special rifle and a .44 Magnum rifle. I found that swaged bullets are another matter. Now, thanks to the new Gun Digest, I can pick a set of tools to make accurate bullets. I saw a 45/70 bench gun which is similar to the one that gets into my thinking from time to time. There were many other interesting things, such as home made actions, reloading tools, etc. There were conversations about hunting or shooting, humorous incidents, new or old experiments.

At the banquet, which my wife still refers to as the best ever, we had good company and talked about many things. I learned of one of the shooters that had mated a Remington 222 barrel to a Martini training rifle and came up with a .218 Bee hunting rifle. And as I just happened to have both with me, we got together.

This is the kind of stuff bench rest matches are made of, and I strongly urge others who have not gone to one, to do so. If you don't have fun and learn a lot, you need a course in Dale Carnegie. Try one.

Yours truly,
Charles Craig
Lockport, N. Y.

The Information Bench

The Information Bench service is available to all Precision SHOOTING readers. With your questions, send a stamped, self addressed return envelope for a reply. Selected questions and answers, covering as wide a variety of interests as possible, will be published in these columns. Address your questions to the following people.

Rifles, all types, accessorise, handloading, components and shooting methods:—**R. W. Lathrop, The Information Bench, 3207-148th Ave. S. E., Bellevue, Washington.**

Sporting handguns and loading—**Kent Bellah, Saint Jo, Texas.**

Question: I saw that since I was a reader of Precision Shooting I could write to you if I had a problem. I do; it is a .257 Weatherby Magnum. I had this made by Mr. Weatherby on a Springfield action. The barrel is 26 inches long, sporting type about .650" at the muzzle end. Could you first recommend any of your pet loads for this caliber? Second, what causes the blacking of the cases after firing; not just the neck but most of the case? What causes a bad group at 200 yards when a good group is obtained at 100 yards.

Thank you for answering my question. The Precision Shooting mag. is the BEST, period.

Charles Miller
Lansdale, Pa.

Answer: If I knew what kind of load you are now using I could possibly help more in suggesting the remedy. However, I believe that "pet" loads belong to "pet" rifles and should not just be passed along to someone else. Remember that what is sauce for the goose may kill the gander.

If your gun shoots well at 100 yards and does not perform at 200, some one or more of the following factors are to blame:

1) You have too slow a twist for the bullet you are using. 2) The powder load is too light. 3) The wind or cross currents are taking effect. 4) The matter of eye sight. Even with a scope, some people are able to see much better at one range than at another. 5) Bad bullets. The less accurate a bullet is, the worse it is at longer range.

Here are some things I have found to work well in the .257 Weatherby: 1) 4831 powder is best. 2) Use bullets of the proper weight for the twist of the barrel. 3) Always seat bullets well out as the Weatherby has a long throat and to do best a large part of the bullet should be in the throat. 4) Do not of course load so that the bullet, when seated, contacts the rifling. 5) Never shoot more than two or three shots in quick succession if you wish your barrel to last.

Question: I'm going to build another .22/250 (have one on a Springfield action) and was wondering about the smooth working DWM 1909 Argentine actions. These are real glass smooth; but will they stand modern loading? Do these cock on closing and can they be converted to cock on opening (the action I saw did not have a trigger)? Would this action also be satisfactory for a .243 Win. or .244 Rem.? James F. Rudolph, Springfield, Va.

Answer: I do not believe I would use the Argentine action for a .22/250. One could, of course, but I would surely rate it below a good Springfield or 98 Mauser. It does not have as good metal as the Springfield, the magazine is not conducive to good stock lines and the trigger and bolt stop are no better, if as good.

I would not consider seriously the Argentine action for the .243 or .244 either. I believe that when cost and quality are considered, the Springfield, the 98 Mauser or one of the new actions with a good micro trigger such as the new F. N. 400 or the Sako Forester is a much wiser choice for your purpose. Remember it is not the first or original cost that is all important. Proper conversion of some of these older military arms gets to be quite costly. R. W. Lathrop

Question: I have purchased a set of Harvey bullet swaging dies and bullet crimping dies and am making bullets for use in my handguns. Would greatly appreciate your answers to the following questions: What weight bullet and what powder for best accuracy in a S&W K-38 for target use? What weight bullet and what powder charge for S&W .357 Magnum 6½ inch barrel, also Colt Python for hunting purposes? I am planning to use the .357's to some extent for deer hunting. The bullet making dies I bought are for making half jacketed Jugular bullets with solid point. I have Harvey's loading data but would like your opinion on the above questions. H. A. Mathias, Palmyra, Pa.

Answer: I go along with the listed Harvey loads for Jugular bullets, but the top charges are **top charges;** therefore I prefer these reduced a bit. Your .357 guns perform beautifully with 17 to 19 grains 2400 with the 127 grain bullets, the former being adequate for deer at any normal handgun range.

The K-38's require a bit of testing for individual guns, using the same bullet with CCI primers first choice. (W-W makes are second if CCI is not available.) I've used as much as 15 grains 2400, **but this is too hot in some guns;** 14 grains is adequate. You need full charges of 2400 in .38's for good accuracy. Use 6.5 to 7.5 grains Unique **carefully weighed.** An even 7 grains shoots well for me, while a friend uses 6.5 grains.

The latter load is pretty close to a target charge, although it's too powerful for competitive shooting. These bullets seem to shoot better at Hi-V.

You can greatly increase the shock on game by drilling a shallow cavity in

(Continued on Page Thirteen)

National Bench Rest Shooters Association, Inc.

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NEW MISSISSIPPI VALLEY REGION DIRECTOR

Alfred W. Walter, 1925 Raft Dr., Hanley Hills, St. Louis 33, Missouri, has been elected Director for the Mississippi Valley Region, NBRSA.

Bench Rest Match Reports

BENCH REST MATCH REPORTS
IOWA FALLS, IOWA

Registered matches for unrestricted bench rest rifle, heavy varmint and sporter class rifles were fired at Iowa Falls, Iowa, Labor Day weekend. The unrestricted rifles were fired under lights the evening of Sept. 3rd with ideal shooting conditions, with 10 competing. The high 4 in the National Match Course agg. were:

	100	200	NMC
John Moschkau	.3326	.4351	.3839
L. F. Carden	.3848	.4267	.4058
John W. Mayer	.3824	.4665	.4245
Joe Dunnington	.3688	.5361	.4525

The heavy varmint and sporter class matches were fired Sunday, Sept. 4th, with clear skies and light gusty winds. Aggregates for both classes were for five 5-shot matches at each 100 and 200 yards. Six shot the heavy varmint class matches and ten in sporter rifle class. High aggregates were:

HEAVY VARMINT RIFLE

	100	200	Agg.
Erwin Wyatt	.5564	.6714	.6139
Kent Beckman	.7188	.9710	.8449
Beryl Sheldon	.7880	.9369	.8624

SPORTER RIFLE

Otto Filbrandt	.7728	.8273	.8000
Willard Lange	.8592	.9011	.8800
Verle Hunt	.8939	.9240	.9091

ILLINOIS STATE CHAMPIONSHIPS

Five shot the National Match Course with unrestricted bench rest rifles Saturday night, Sept. 3rd, at Windsor, Illinois, for the Illinois State Bench Rest Rifle Championship. It is reported that there was no wind but that the moon gave some trouble, though the aggregate records don't indicate that it was very serious. The three high aggregates were:

	100	200	NMC
Ted Holmes	.269	.4195	.345
Harold Cole	.391	.5055	.397
D. Davison	.426	.4970	.462

J. Shepler had a .530 agg. and H. Owen a .589.

ST. LOUIS, MISSOURI

Six competed in the Missouri Championship Hunting Rifle Trophy Match on the Bench Rest Rifle Club of St. Louis range, Sept. 11th. James Ernst, the club secretary, shooting a .257 Remington 722 rifle which he had restocked, made a clean sweep of the 5-shot match aggregates with 1.144 at 100 yds., 1.354 at 200 and 1.249 MOA for the grand aggregate. Col. Townsend Whelen, shooting a .308 Win. in Douglas barrel on FN Mauser action with the Sierra 168 gr. International bullets, was runnerup with 1.370 at 100 yds., 1.471 at 200, and grand agg. 1.421. Walter Strippgen, shooting a .243 in Ted Holmes barrel on Mauser action, had third grand agg. of 1.460 MOA.

Seven shot the National Match Course (5-shot matches) with heavy varmint rifle, Barbara Schellert winning with .506 MOA, William Schellert second with .513, and A. J. Freund, Sr. third with .523. Barbara Schellert shot smallest 100 yd. group of .200 inch. Art Freund, Jr. shot smallest 200 yd. group (.600 inch) and won the 200 yd. agg. with a .512 MOA.

NEW YORK STATE CHAMPIONSHIPS

On Sept. 11th the Dryden Fish & Game Club held the New York State Bench Rest Championships for unrestricted and heavy varmint class rifles. The weather did not cooperate and it rained continuously all day.

There was naturally plenty of grumbling and cussing at the weather, but things were brightened up by fellows like Bob Stinehour yelling "don't forget to drain the barrel between shots" or "which dot in this scope do I use to aim with" (water drops on the lens). When one of the shooters would get to look wet and miserable, someone would remind him that it would be a lot worse if he were a smallbore shooter and had to lay down in that mess and shoot.

So, rain as it did, five shot in the unrestricted class and eleven in the varmint class matches.

Ed Shilen must be part duck, as he thrived on the wet weather and shot two aggregates (200 yard and Grand) which will possibly be records for the year. He also shot a 5-shot group at 100 yards which measured .130 inch, this being smaller than the present 5-shot record of .169 inch.

High aggregates were as follows:

Unrestricted Rifles

	200 yd.	100 yd.	NMC
Omar Rinehart	.5389	.4416	.4902
Bob Stinehour	.5500	.4842	.5171
Bill Cotter	.5892	.4726	.5309

Heavy Varmint Rifle

Ed Shilen	.3592	.3780	.3686
Ross Sherman	.5041	.4036	.4538
Gerry Arnold	.5330	.4752	.5041

Reporter, Russ Cuatt

TULSA, OKLAHOMA

At the Tulsa Bench Rest Rifle Club's last shoot for the season the Varmint Rifle shooters outnumbered the Unrestricted Rifle shooters almost 2 to 1 (13 to 8). Weather for this Sept. 18th shoot was good with temperature in the low 90's and light, variable winds. The high aggregates were:

100 Yard Aggregates
Unrestricted Rifle

Horace Powers	.498
Larry Engelbrecht	.660
Bob Berry	.676

Varmint Rifle (5-shot)

C. R. Kunkle	.581
Jack Morgan	.602
Red Cornelison	.605

200 Yard Aggregates
Unrestricted Rifle

A. L. Day	.676
Horace Powers	.758
Ed Grishaw	.966

Varmint Rifles

Dave Lewis	.746
J. D. Hale	.832
Red Cornelison	.857

National Match Course aggregates
Unrestricted rifle

Horace Powers	.616
A. L. Day	.753
Larry Engelbrecht	.861

Varmint Rifles

Red Cornelison	.731
Jack Morgan	.763
C. H. Kunkle	.768

ALLENTOWN, PENNSYLVANIA

At the September 11th match of the season long bench rest shooting program for hunting rifles, fired on the Guthsville Rod & Gun Club range, Larry Nuesslein shot the two smallest 5-shot groups with .22 cal. rifle—.283" and .373"—while Bill Blose took second place award with his .392" group. For the larger caliber guns, Dr. William Fox won with his .680" group and Nuesslein was second with .727".

At the September 25th match, Bruce Romig won with smallest .22 caliber group of .393" and Roland Hilbert second wtih a .544" group. For the larger calibers, Nuesslein had smallest group of .965 and Dr. Fox second with 1.130".

Romig shoots a .222 Rem. in Buhmiller barrel on Sako action in a Jaeger stock. His load for winning was 25 grs. Ball C powder, Sierra 50 gr. spitzer bullets and Western 6½ primers.

PLAINFIELD, NEW HAMPSHIRE

A small field of 12 shooters fired the bench rest shoot at Plainfield, New Hampshire, September 18-19, under good conditions; generally overcast sky, moderate temperature and very light winds.

Mary Hollidge shot superbly all day to make an outstanding win. She made

Mary Hollidge ("Merrie Stuhlschutter") did a consistently superb job of bench rest shooting to beat the small but tough field of male competitors in the National Match Course aggregate at the September 18th match in Plainfield, New Hampshire.

R. L. McLaren, Abilene, Texas, shooting his Winchester Model 70 factory rifle in .243 Win. caliber with which he won the Sporter Rifle Aggregate during the National Varmint Rifle Cahmpionships at San Angelo, Texas, in August.

Henry Spencer, Texas Bench Rest Shooters Association president (left), presenting Paul Gottschall, Salem, Ohio, the National Light Varmint Rifle Championship Trophy which he won in the first National Varmint Rifle Championships at San Angelo, Texas, in August.

a clean-sweep of the aggregates; .349 at 100 yds., .445 at 200 yards, and NMC aggregate of .397 MOA. She won four of the five 100 yard matches and two of the 200 yard matches.

Al Glendening was secnod all the way with .434 at 100, .484 at 200 and NMC of .459. Bob Stinehour was third in the 100 yard aggregate (.462) and htird in the NMC with .5075. Howard King was third in the 200 yard aggregate with .537 MOA. (The P. S. editor clinched the "booby" spot with a whopping .8517 NMC agg.)

YREKA, CALIFORNIA

A total of 26 shooters participated in the Yreka Rifle Club's bench rest match on September 3rd and 4th. The program included the National Match Course aggregates for each unrestricted bench rest rifles and both heavy and light Varmint rifles. All the 200 yard matches were fired on Saturday, Sept. 3rd and all the 100 yard matches on Sunday, Sept. 4th.

Wind conditions were really bad on Saturday for the 200 yard shooting. Even with the unrestricted rifles, six of the nineteen competitors disqualified in one or more matches. With the heavy varmint rifles only four of fifteen were able to stay in the record target area for all five matches, and only four of eight failed to disqualify with the light varmint rifles. Conditions were better on Sunday and some very respectable groups and aggregates were fired at 100 yards. Aggregate award winners were as follows:

UNRESTRICTED BENCH RIFLES: 200 yard aggregate—Ray Jones, Yreka, .7861; L. E. Wilson, Cashmere, Wash., 8280; Virginia Jones, Yreka, .9039 (there were only 6 aggregates under one minute-of-angle).

100 yard aggregate—L. E. Wilson .477; Dr. Rod Janson, Seattle, Wash., .5058; Ray Jones .5564.

National Match Course aggregate—L. E. Wilson .6522; Ray Jones .6713; Raymond Speer, Lewiston, Idaho, .7866; Dr. Rod Janson .7946; and Virginia Jones .8370.

HEAVY VARMINT RIFLE: 200 yard aggregate—Dr. Rod Janson 1.3055; Ray Jones 1.3583; and Ruth McMillan, Phoenix, Arizona, 1.6239.

100 yard aggregate—Ed Suchan, Oakland, Calif., .5280; Pat McMillan, Phoenix, Ariz., .5554; and George Hendricks, Etna, Calif., .6106.

National Match Course aggregate (5-shot matches)—Ray Jones 1.0579; Dr. Rod Janson 1.0788; Ruth McMillan 1.1353; and E. Frombach, Seattle, Wash., 1.5529.

LIGHT VARMINT RIFLE: 200 yard aggregate—Roy E. Meister, Seattle, Wash., 1.0530; John B. Sweany, Calistoga, Calif., 1.2697; and Pat McMillan 1.4560.

100 yard aggregate—Jack Bridewell, Gazelle, Calif., .7284; Pat McMillan .7380; and Gale McMillan, Sacramento, Calif., .7952.

National Match Course aggregate—Roy Meister .9522; Pat McMillan 1.0970; John B. Sweany 1.1494; and E. Frombach 1.3548.

FASSETT, PENNSYLVANIA

This past summer some of the fellows from the South Creek Rod and Gun Club attended. one of the Varmint Rifle bench rest matches at Dryden, New York. Most of the fellows were amazed at their poor showing in this type of shooting and decided to do something

(Continued on Page Twelve)

South Creek Rod and Gun Club range officer John Early (right) presenting aggregate trophies to Ross Sherman from Dryden, N. Y.

Bench Rest Match Reports

(Continued from Page Eleven)

about it. As a result they went home and put in ten benches on their own club grounds, which are located 9 miles south of Elmira, New York, on Rt. 14, to be used for their own shooting and to hold open matches.

Unregistered shoots were held August 14th and 28th with 16 and 18 shooters participating and a third was scheduled for September 25th (no report on that yet—Ed.). The shoots were for Varmint Rifles and the 5-shot match National Course was fired. Gold trophies were awarded to winners of the 100 yard aggregate, the 200 yard aggregate and the Grand aggregate. Ross Sherman from Dryden, N. Y., was overall winner at both shoots. The high aggregates were:

August 14th	**200 yd.**	**100 yd.**	**NMC**
Ross Sherman	.398	.314	.356
Chester Andrews	.618	.601	.609
Ray Wilson	.598	.641	.619
August 28th			
Ross Sherman	.547	.454	.500
Art Blensinger	.509	.603	.556
Jerry Arnold	.637	.549	.593

While bench rest shooting is a new venture for this club, competitive shooting is not new for them since they hold numerous shoots of various types during each year.

Reporter, Gerald Arnold
Troy, Penna.

AUGUSTA, OHIO

Some light showers on Saturday and tricky winds both days of the September 18-19 shoot at Reed's Run Rifle Range are reported, but the weather did not seem to bother the shooting of the experienced shooters, judging from the winning groups and aggregates made.

Five 5-shot and five 10-shot matches at 200 yards were fired Saturday. Winners for the 5-shot match aggregate were: Ralph Stolle .321 MOA, Ernest Scafuri .322, and Clarence Deem .346. Winners for the 10-shot match aggregate were: Robert Hart .4657; Ralph Stolle .4666, and C. A. Mauk .4668.

Five 5-shot and five 10-shot matches at 100 yards were fired on Sunday. Winners for the 5-shot aggregate were: Robert Hart .265, Ernest Scafuri .280, and Paul Gottschall .282. Winners for the 10-shot aggregate were: Paul Gottschall .296, Bernice McMullen .369, and Ernest Scafuri .370.

A pretty 100 yard 10-shot group (top) on the fired match target display rack at the September 18th bench rest match in Plainfield, New Hampshire. That center-ring is one-half inch in diameter.

The National Match Course aggregate winners were: Paul Gottschall .383, Robert Hart .430, and Ralph Stolle .435.

At a meeting of members held at noon Sunday, Paul O. Gottschall was unanimously re-elected Deputy Director for the Great Lakes Division of the Eastern Region, NBRSA.

End of official National Bench Rest Shooters Association, Inc. section.

BENCH REST TARGET LOAD VELOCITIES

Charles L. Neumann

(Editor's note: Charlie Neumann, a member of the Tulsa Bench Rest Rifle Club and a serious, careful experimenter in rifle accuracy problems, chronographed target loads of all participators in the 1960 National Bench Rest Championship matches in Tulsa, Oklahoma, who wished to take advantage of that opportunity; and a good number of them did. His report of the testing and his comments on accuracy velocities are as follows.)

Dear Phil:

I am sending the results of the checking with my chronograph at the National Matches in Tulsa. Since the results were available to anyone who cared to look at the record book, and some of the shooters did, I feel that anyone who might be interested should also be able to see the figures.

From time to time the loads have been published and there is always a tendency to try the other fellow's load and see if it works in one's own gun. The fact that a load worked well in another's gun is no proof that it will in another gun, unless the same set of specifications are applicable to both guns.

You will notice that most of the Wasp (.219 Don) velocities are in a certain velocity range, and this is also true with the .222 Rem. and the .222 Rem. Magnum rifles. While they fall in the same velocity range they were not all accomplished with the same load. This much we can conclude; the shooters knew what their best load was in terms of grains of powder but did not know what their velocity was. It seems they all arrived at the same point but by various methods.

Now if your mind is not made up I will try to confuse you with the few facts I have gathered along this line. While the tests I have made are with only one gun and several powders, they establish a trend in things but do not prove anything as yet. With the various powders we have on the market now it is like a kid walking into a candy store with a quarter (used to be a nickle).

I used the .222 Rem .in a gain twist barrel by Johnson and standard chamber. The experiment started some time ago by using the powder at hand at the time to find my best load for the gun. The C Ball load was 22.8 grains. That gave me the best accuracy. Next I tried 4198 and 20.7 grains was my best load. The next trial was 23 grains of 4895 and this was the best load for the gun. These loads were all within the velocity range of 3050 to 3100 feet per second.

The next thing I felt I should try was to get better uniformity in my loads, as the 50 ft. sec. variation between the 5 loads tested with each powder after I got my best load did not satisfy me that it was the best I could do. I seemed to get the impression that the 4895 was not all burning with the 50 grain bullet. The C Ball was a little better. The 4198 seemed to be better than the Ball if the loads were carefully weighed. This is the thing about 4198 that I did not like. It does not throw well in the powder measure.

Being lazy, I had a feeling the H4227 powder from Hodgdon would be more uniform for light bullets. Not having the dope on the powder, I ran a series of tests to set a graph of the velocities attained with each .2 grains increase from 16 grains to 18 grains. It ran at 16 grains 2760 f.s. to 3360 at 18 grains. I next picked out the best load velocity and

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loaded 10 cases with 17.4 grains for 3060 f.s. This was also my best load, as I tried other loads and they were not as good. This was the most uniform powder I have tested as the velocity was not more than 10 f.s. variation between loads. This powder is very touchy if it is not weighed or thrown accurately, but since it is in small grains and very uniform it is not any problem. The thing **not to do** is jump up a grain at a time as you might get a stuck case or blown primers from overloads.

The tabulated loads were checked at the range and recorded by me. They may or may not be the load actually used in the matches, for with the information received some of the shooters may have made some adjustment. I feel the shooters may have made some adjustments to favor the local conditions, which were miserable. I found the shooters very cooperative and anxious to help compile this information.

Shooter	Load	Powder	Bullet	Cartridge	Velocity
E. A. Anderson	23.5 gr.	Ball	49.8 B&A	.222 Rem.	3267
John Hart	27.5 gr.	3031	54 B&A	.219 Don	3584
J. Dunnington	23.8 gr.	Ball	53 Sierra	.222 Rem.	3174
Clyde Yockey	26.4 gr.	3031	51 B&A	.219 Don	3333
F. C. Murdock	30.5 gr.	3031	54 Culver	.22 Dart	3533
E. Scafeiri	20.6 gr.	4198	51 Brown	.222 Rem.	3257
E. Scafeiri	38.5 gr.	4676	72 Brown	.243	3446
Al Johnson	28.5 gr.	Ball	52 Culver	.219 Don	3236
Al Johnson	38.5 gr.	4676	72 Brown	.243	3278
George McMullen	20.8 gr.	4198	51.5 B&A	.222 Rem.	3300
Bernice McMullen	20.8 gr.	4198	51.5 B&A	.222 Rem.	3257
Wallace Wegener	28.0 gr.	Ball	50 Bahler	.219 Don	3322
D. E. Herman	26.5 gr.	3031	55 Baldwin	.219 Don	3424
R. W. Stolle	21.0 gr.	4198	52 Culver	.222 Rem.	3333
F. C. Murdock	24.0 gr.	4198	54 Culver	.222 Mag.	3448
H. L. Culver	26.5 gr.	3031	52 Culver	.219 Don	3521
Robert Hart	23.5 gr.	4198	50 B&A	.222 Mag.	3448
C. Neumann	17.4 gr.	4227	50 B&A	.222 Rem.	3039
V. Duncan	23.8 gr.	Ball	53 Sierra	.222 Rem.	3021
J. M. Reece	25.8 gr.	3031	50 B&A	.222 Mag.	3446
J. M. Reece	23.4 gr.	4198	50 B&A	.222 Mag.	3558
George Kelby	24.8 gr.	Ball	51.1 B&A	.222 Rem.	3322
E. L. Beecher	27.4 gr.	Ball	51 Beecher	.222 Mag.	3322
A. W. Walter	27.2 gr.	3031	52.2 B&A	.219 Don	3635
Ed Grishow	26.7 gr.	3031	50 Bahler	.219 Don	3460
M. Reed	28.0 gr.	Ball	52 Speer	.219 Don	3484
R. G. Berry	21.3 gr.	Ball	50 B&A	.222 Rem.	2932
G. Wilkenson	25.2 gr.	Ball	53 Sierra	.222 Rem.	3267
A. G. Parker	22.9 gr.	4198	52 B&A	.222 Mag.	3436
J. Hutchinson	34.5 gr.	4676	52.5 B&A	.22 Comet	3731
J. Hutchinson	24.8 gr.	4676	52.5 B&A	.222 Rem.	3134
Ferris Pindell	22.5 gr.	4895	55 B&A	.222 Rem.	2915
F. Gibson	22.5 gr.	4895	55 B&A	.222 Rem.	2816
John Moschkau	23.8 gr.	Ball	53 Sierra	.222 Rem.	3194
Paul Gottschall	22.6 gr.	4198	51.5 B&A	.222 Mag.	3387
W. Coleman	27.0 gr.	3031	50 B&A	.219 Don	3412
W. Coleman	27.0 gr.	3031	55 B&A	.219 Don	3436
E. Thomason	23.3 gr.	Ball	53 Sierra	.222 Rem.	3134
R. W. Click	23.2 gr.	Ball	53 Sierra	.222 Rem.	3154
J. C. Anderson	21.2 gr.	4198	53.2 B&A	.222 Rem.	3225
H. Jennings	30.0 gr.	3031	57 B&A	.22/250	3278
Horace Powers	23.8 gr.	Ball	55 B&A	.222 Rem.	3115
Dale Apperson	24.3 gr.	Ball	53 Sierra	.222 Rem.	3076

The conditions at 200 yards were such that the higher velocities seemed to stand out as far as the winners go. The best groups I spoke of earlier were fired in ideal conditions in the evening. You can blame poor conditions, and in my case poor judgment, for the performance at the match for when groups go out to 1.500 inches at the middle of the day and shrink up to .675 in the evening it is pure guess work that is the difference. Those that could dope the conditions won the matches, and those that couldn't got the big groups, and the experience.

The Information Bench

(Continued from Page Nine)

the nose of the loaded ammo with the 1/16" Hollow Pointer for the Forster Case Trimmer. Kent Bellah.

Question: Please suggest Jugular or Prot-X-bore loads for heavy duty use in a 4" M & P and an altered, mixed number 3" "Victory" M & P. Which bullet is best in the .38 Specials? Which powders? Ed Sledge, McAllen, Texas

Answer: The 127 grain Jugular is most efficient at Hi-V with heavy loads. The center of impact is low at long range, which is corrected with target sights. Probably your fixed sight revolvers are best loaded with the 156 grain Jugular. Try it with 12.5 grains 2400 for 1,150 fps, or 6.2 grains Unique for 1,100 in your 4 inch barrel.

For your mixed number "Victory" gun, I strongly advise cutting these charges. A better deal is to trade for a .357 Combat Magnum for more power, more strength, better accuracy and target sights.

Unique is a fast powder that burns well in barrels as short as 2 inches. 2400 may not burn completely in a 4 inch tube, but it burns with fine uniformity if charges are heavy enough, giving excellent accuracy. A heavy crimp is necessary.

For defense work you can use the 127 grain Jugular with 14 grains 2400 for 1,300 fps. The center of impact is close enough to point of aim at close range. In .357 guns you can use 17 to 19 grains of 2400 for a terrific punch. You'll have to see the destruction on varmints to believe it.

Shocking power is greatly increased by drilling a cavity in the nose of bullets in loaded ammunition. This is easily done with the Forster Hollow Point attachment in the Forster Case Trimmer. Bullets hold accuracy after drilling. I believe the Prot-X-bore bullets are best for moderate and low velocity rather than Hi-V. Kent Bellah

Question: What loads can I use in a Colt Frontier #147428, Cal. .38/40?

(Continued on Page Fourteen)

TO THE ACCURACY SHOOTER
Are you tired of bringing home alibis? Mike Walker's 6mm International case, shooting the 90 gr. bullet at approx. 3200fs is showing more accuracy than the .30-06 or .308, bucks wind better than the .30-06 180 gr. at 2600fs. Build your Free Rifle or Bench Gun to shoot in the wind. For the shooter who wants the finest I can still furnish Weber Actions, Hart or Douglas Premium barrels and my Precision Dies.
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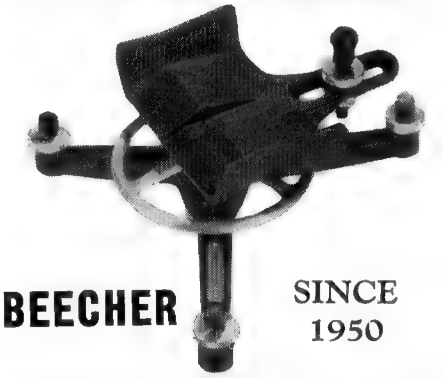

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The Information Bench

(Continued from Page Thirteen)

Haven't loaded for this pistol and before doing so would like some loads, since a few of the local "Boys" have said not to use pistol powders—use only black powder. James F. Rudolph, Springfield, Va.

Answer: From this distance I can't say what pressure your old Colt will take. It isn't as strong as current Colt S. A.'s. Many gun writers claim the old guns are not safe with smokeless powder, but I've fired a good many and never had an accident or damaged gun.

I believe in being double careful with old guns. Loads in this .38/40 caliber may give more than average variation in different guns.

If the gun and chambers are in good mechanical condition I think it will take loads up to 15,000 psi, generally obtained with 180 grain bullets and about 6 grains Bullseye, with CCI Large Pistol primers. Much depends on the gun, case, bullet, and other factors. I will not recommend a specific Max. load for obvious reasons.

If it was mine, I'd tie it to an auto tire and proof all chambers with 5.5 grains Bullseye, pulling the trigger with a string. Some lads will say you are being too careful, and others that you are playing with something dangerous. It doesn't bother me what people say, as I have two good eyes and two good hands. If the gun passed inspection after proofing, I'd feel perfectly safe with moderate loads.

Lyman's No. 40188 is a good pill, and easier to load than the original No. 40143. As little as 3.5 grains Bullseye is good for plinking, and 4.5 grains is better, starting at about 800 fps. CCI Large Pistol primers are specified to insure good ignition with low loading density, necessary for practical accuracy. Illinois Bullet Alloy No. 4 is excellent. For a home mix try 1:16 tin-lead.

The .38/40 was a fine caliber in the old days. Our gun makers could bring it up to date with modern loads much more potent than the .357's and with less recoil than .44 Magnums. The gun makers say they will produce a .40 caliber when a cartridge is available. The ammo makers say they will produce the ammo when we have a gun to shoot it. These good people are friendly with each other, but they act as far apart as the U. S. and the USSR. I think a modern .40 caliber would fill a void in the revolver field. After all, the .357 and .44 Magnums are the only two revolver cartridges designed for smokeless powder. All of us can hope for a modern .40, and perhaps we'll have it someday. Kent Bellah

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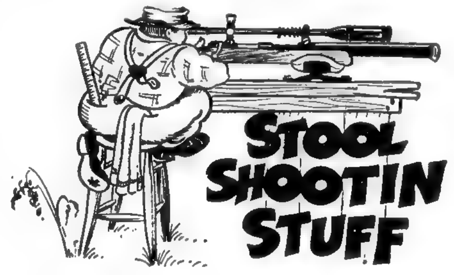

Dear Phil:

Your letter of several days ago mentioning the opening of the small game season in Vermont made me quite envious. The nights and occasional days now on Cape Cod are just sufficiently Fallish to get my hunting blood to boiling, and I am well along on plans for deer hunting. I've got a good long season mapped out in my mind but that is nothing new for me—I have been doing it for years. The trouble is the season is never as long or as unbroken as I plan it. No matter how good a time one has on a hunt, it rarely equals the pleasure a person gets in planning or the memories that linger after the hunt is over.

Your attempt to get a series of Fall foliage pictures showing the beautiful colors makes me envious, too, because although we generally have very pretty and colorful contrasts of bright foliage with the blue water, this year we are going to miss it because of the shabby treatment we received from hurricane "Donna." Almost every bush and tree took a terrible beating from the wind and the salt moisture carried along with it. The white pines look like they have been scorched by forest fire wherever they were exposed to the winds and the oaks show many signs of those terrific wind velocities. Many of the oaks and practically all of the maples are defoliated so winter is settling down early on Cape Cod.

Although we knew of Donna early, the forecasters did not expect the path to go so directly over our heads until late the night before the storm. We had from daylight until noon to try to button up and put the wire braces on the picture window and block down the garage doors. Some of the lawn furniture got tossed about a bit but Merrie had lashed most of it securely to the stone wall. Our worst damage occurred from downed and broken trees plus a ruined paint job on the house because of the millions of pieces of leaves Donna left plastered so firmly against the paint that the house looked green instead of gray and white. We did not have so much rain as many sections in the storm but I think we established something of a new record for high velocity sustained winds. For two hours in the center of the storm the wind velocity kept almost steadily at the 100 mile an hour pace. Occasionally it would whip up to 110 but rarely did it go below 90. The three hours before the storm and three hours after the storm, the winds were pretty rugged. The telephone lines held but there was no power for about 48 hours.

The absence of heavy rain and the fact that the worst of the storm occurred mid afternoon gave me a terrific yen to go out and test a gun in those velocities. The wind was almost directly across my range and had not caution gotten the better part of valor, I would have gone out to see just how much drift there would be to my bullets. I bet I would have been printing on target frames two or three to the left of mine had I been shooting and not afraid of a tree top clobbering me.

This is the season of the year when a lot of testing of rifles other than the benchrest type takes priority. I go through the same stage each year even though I full well know that I will probably reach in the rack and take a gun that would very creditably kill deer at most of the normal ranges just as it is now sighted. Last year I hunted for the first time with my Taylor and Robbins 7 m/m Magnum and prior to that season, had worked up a pretty good load for a 140 grain home made cavity bore bullet. Clair and Don have done quite a lot of experimenting with the 120 grain bullet but it seemed to me that the loss of velocity in the ranges that that chamber was capable of obtaining called for a heavier bullet. Even with a full case of powder I was not showing any signs of pressure.

This year I decided to test out a few rounds loaded with a still heavier bullet. Sierra doesn't make a long enough jacket to make a heavy 7 m/m bullet in my dies and still give me the cavity core feature, so I have to draw long 30 caliber jackets down ot 7 m/m. This not only gives me a heavier walled jacket but a longer one. Several evenings ago, I was testing this rifle with three shots to a string and made nine consecutive bullseyes at 100 yards on a ¾" bull. Two of the three shot groups were better than .400. Several days later, I got a letter from Don Robbins telling how one of his customers had made some 1¼" groups at 200 yards. I thought if my rifle would make ⅜" at 100 yards, I should do better than the other chap at 200 yards. I surprised even myself by getting a .680 group.

It has often been said that we fellows are missing the boat by not testing out our big rifles more and now I am rather sorry that I turned down the barrel on a 7 m/m benchrest gun that I had several years ago. I would now like to have it so that I could rechamber it for that T & R Magnum case and see just how well it would do in a benchrest rig instead of a 9 pound hunting rifle with a hunting scope and mount. There is only one fly in all of this ointment. I wonder just how long the barrel life would be. In the preliminary testing, I fired the rifle eighty times one afternoon and the next morning and my shoulder was a little colorful for several days.

My chronograph indicated 3500 ft. per second with 66 grains of 4350 and a 215 primer. That's a pretty high velocity but in looking at the Speer figures for 7 X 61, a case which resembles T & R some, I note that the figures for that cartridge in a considerably lighter load reach some pretty high velocities.

Now I am trying to get my 7 X 57 to handle a 160 grain bullet with similar accuracy and high velocity. 4676 seems to be the leading powder at the moment in my 20" barrel but it is too early to be sure. The hottest loads from the bigger case extracted like a .222 and showed very little sign of pressure even with the standard large rifle primer but the 7 X 57 begins to stretch cases with real hot loads and although I have loaded none up that extracted really hard, there is a noticable difference for the pressure required for the camming action.

I presume you are well supplied with copy covering the Johnstown shoot. I had a good time and had I not muffed one target in the 100 yard matches, I would have come out even better than seventh place; that, is, of course, if some other fellows had not muffed their targets somewhere along the line also. I thought the shoot was very well handled and that the Pine Tree folks did a fine job. Their clubhouse has been consistently improved and I was heartened to hear that the club officials had enough confidence in benchrest shooting to plan for 50 new cement benches before next year's Nationals. The range is certainly beautifully set up and those who shoot at it are very fond of it. Merrie and I camped out in the station wagon and pop tent and were most comfortable, and thanks to the excellent meals served at the club house, we were better off than we would have been at a hotel or motel and I am sure my dog, Jock, enjoyed the occasion as much as we did.

Times certainly do change a lot and I can well recall the Johnstown range as of four or five years ago. At midnight, there would have been a dozen or so shooters firing at targets under the lights in an effort to get their gun to performing better. This year I don't believe there was a shot fired after 8 o'clock and had it not been for the interesting gatherings at the club house, one could have gone to bed and slept from sundown to sun up. The bar at the club house pedals out quite a bit of liquid refreshment and at a reasonable fee but it is a great compliment to the shooters that they not only show moderation during their evening's activity but they very wisely set a good example by not mixing their alcohol and gun powder during the shooting hours.

While I am complimenting the club officers, I should mention the banquet held on Saturday night. The meal far exceeded those of previous banquets. The number who turned out as old timers was a little disappointing but I think that is somewhat the fault of the shooters. We just must make things more inviting and show those fellows we sincerely miss them. I took a couple of extra benchrest jobs with loading equipment, hoping to help someone else to enjoy the event. There are many fellows with extra rifles who should now be picking out someone to take to next year's, where it is hoped we will have a real old timer's get-together.

Some different shoulders will be carrying the load of the Association activities of the shooters this year and they need the support of shooters if they are going to reverse the trend that has occurred in recent years. I hope they will listen to honestly offered advice and weigh it well before acting arbitrarily. We like to think of the shooters as a democratic group, differing in opinions, of course, but all members are deeply imbued with a love for the shooting game, and they as individuals are hurt when their sport is endangered or injured. The question has already arisen in the minds of many as to whether or not the new rules for the National Match requiring 100 record shots at each range will help or hurt. I feel it is as plain as black and white that it will be to the advantage of the experienced shooter. Perhaps some will attend these matches just to get more shooting and if there is truth in the argument that many use it as a vacation period, the event will be an attraction. Shooting is a very relaxing and pleasant hobby which varies adversely with the rush and pressure of relays which too closely press upon one another. Evidence of the foregoing is clearly obvious at the smaller friendlier matches where there is time for reloading and a little visiting too.

Some of last year's Maine buckbusters are assembling again this year and by the time this is printed and distributed, I'll be among them. If last year was any sample of what to expect in a deer camp during the evening hours, there'll be many long arguments as to what is good or bad for benchrest shooting, but I hope there will be more intervening stories of game shot this year than there was last. I'll report on that in the next letter.

Cordially yours,

Ernest Stuhlschutter

BULLET JACKET WALL THICKNESS VARIATION IN RELATION TO ACCURACY

Wm. E. Cotter

At the past 1960 Labor Day Shoot at Johnstown, some of us had a discussion on the part that variation in wall thickness of the hulls (bullet jackets) affects accuracy and how much this variation causes the group to enlarge. My good friend Cline Deere gave me a dial indicator for checking hulls, and of course anyone who knows Cline Deere can realize the quality of workmanship on this setup. I have used other indicator set-ups but never one so positive as this one. With it, it is no trouble to check a hull wall to within one half of a ten thousandth.

As a result of that discussion, and wanting to put the new indicator to the test, I checked out a batch of hulls and separated them into three lots as follows: Lot #1, wall variation of .0002" to .0004". Lot #2, wall variation of .0004" to .0006". Lot #3, wall variation of .0006" to .0008".

These sorted hulls were all seated with the same lot of formed cores, allowed to stand for 24 hours and the bullets swaged the next night.

As I wanted to fire all of this test at

(Continued on Page Sixteen)

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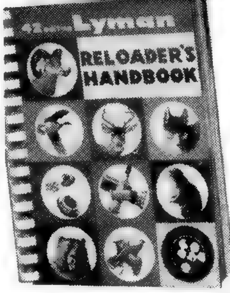

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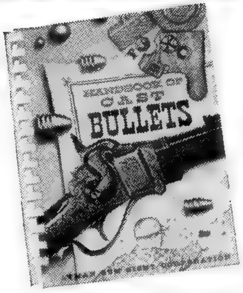

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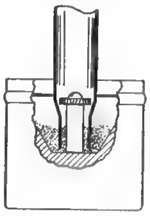

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4. First and Second places, 300 meters, Du Bois, Pa., 1957, Clair Taylor and Don Rob
5. National Match Course, Du Bois, Pa., 1957, 1st, 3rd, 6th, 7th places.
6. National Match 10-shot 100 yd. aggregate, Augusta, O. Al Creighton, .3105".
7. National Bench Rest Championship, Johnstown, New York, 1955, Sam Clark, Jr.
8. 10 Shot 200 yard WORLD RECORD, Du Bois, Pa., 1954, Sam Clark, Jr. Score, or Group, .5276"
9. 10 Shot 200 yard WORLD RECORD, Du Bois, Pa., 1956, H. L. Culver (Present record) Group size .4016"
10. 1000 Yard, Famous Wimbledon match, any sight, 1955, Camp Perry, O. Frank Conway.
11. 1000 Yard, Famous Wimbledon match, any sight, 1956, Camp Perry, O. Frank Conway.*
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All of the above barrels were barrels regularly used by the above shooters in setting these marks. They were not selected in advance by firing tests. All were regular PRODUCTION MADE BARRELS.

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Bullet Jacket Wall Thickness Variation

(Continued from Page Fifteen)

one session, I decided to use two rifles, and loaded 10 rounds from each lot of bullets, for a total of 30 rounds for each rifle.

One rifle is 219-8 which has a Hart action and Hart barrel, and has been fired a total of 3,634 rounds. The other rifle is 219-7 which has a Rem. 722 action, Hart barrel, and has been fired 1,760 rounds.

I decided to fire 5-shot groups at 100 yards, snice I felt that any fliers would show up more with a 5-shot group than with 10-shot. In firing the test, one 5-shot group from each lot of bullets was fired in the first rifle (219-8) for a total of 15 rounds. Then the second rifle (219-7) was fired in the same manner; one 5-shot group from each lot of bullets. Then the remaining three 5-shot groups (one from each lot of bullets) were fired from each rifle, in the same sequence, to complete the test. Weather conditions for the test were the best I have fired in this year, with temperature being 65 degrees, overcast and dead calm wtih not even a leaf stirring. Results of the test firing were as follows:

Rifle 219-8 Bullets from

	Lot No. 1	Lot No. 2	Lot No. 3
First groups	.15"	.20"	.42"
Second groups	.28"	.39"	.39"
Average	.215"	.295"	.405"

Average of all—.305"

Rifle 219-7 Bullets from

	Lot No. 1	Lot No. 2	Lot No. 3
First groups	.25"	.22"	.40"
Second groups	.16"	.35"	.33"
Average	.205"	.285"	.375"

Average of all—.288"

Total variation between the two guns and holding—.017"

One hundred shots fired from each lot of bullets (hulls) would give a more positive test, but it does seem that 20 shots fired from each lot, in two different rifles, with approximately the same variation in each rifle, gives some fair indication as to the affect variation in bullet jacket wall thickness does have on bullet accuracy.

PLINKING RIFLES ON THE RANGE

James W. Scoville

The majority of beginning junior shooters are introduced to organized .22 rifle competition and qualiifcation courses through the use of the ordinary hunting and plinking rifles sold in hardware and sporting goods stores throughout the nation. Last Winter I conducted some experiments with rifles of this type in an attempt to find their accuracy potential. It was thought that any rifle used for indoor shooing should be able to consistently shoot possible scores over a 50 foot range on the NRA target. The 10 ring on this target is .19" in diameter. 50 feet is 1/6th of 100 yards so a minute of angle at this distance is .166"; less than the diameter of the 10 ring. It was therefore determined that any 10 shot group measuring ⅝th" or less from the outside edges of the farthest holes would be considered acceptable, as all shots in such a group would be in or touching the 10 ring. Firing was done from the prone position using a kneeling cushion under the sling arm. All rifles tested were equipped with Lyman 57 micrometer receiver sights, Stevens globe front sights wiht aperture, and a sling. Winchester "Leader" ammunition was used in all tests together with Western Mark III match ammunition in certain instances. All rifles were in excellent mechanical condition and of post-war manufacture.

It was decided to confine all testing to bolt action single shot and box magazine rifles. The tubular magazines preclude bedding and barrel tension adjustments and are usually not adapted to single loading.

First off, three single shot rifles of different manufacture were tried, shooting them was "as issued." Two 10 shot groups were fired through each rifle, but only one gave acceptable groups. The trigger on this rifle was somewhat lighter (about 4 pounds) than the others, which may have had some effect on the groups. I would like to mention however, that none of the six rifles tested had a trigger that could be called satisfactory. Most let off at 6 pounds or more and all had varying degrees of creep and backlash. These triggers can be improved somewhat by stoning, polishing and adjusting, but this involves considerable work and should only be done by a person experienced in such matters. As is, these triggers are far from adequate for serious shooting.

The next step was an attempt to improve the accuracy of the remaining two guns. Virtually all U. S. made .22 rifles of this type are held together by a takedown screw that enters the underside of the stock a few inches in front of the trigger. This screw threads into a lug attached to the barrel or into a hole in the forward portion of the receiver. The barrel and action contact the stock usually at two points; at the rear of the receiver and at the forend. Thus when the takedown screw is tightened, it causes a slight bending of the barrel-action assembly between these two contact points. It was thought that this bending could have an adverse effect on accuracy, so both rifles were glass bedded to eliminate this condition. With receivers solidly bedded and barrels free floating, no improvement could be seen, in fact groups were if anything somewhat larger than before. Paper shims placed under the barrel at the forend tightened up the groups somewhat, but not to an acceptable standard. No noticeable improvement could be effectuated by the use of match ammunition. The next move was to attach weights to the barrel, in this case pieces of bar solder secured with tape. Results were negative.

Attention was next directed to three magazine rifles. Two light hunting models of different manufacture and one so called "medium priced" target rifle of current make. The target rifle shot acceptable groups from the first, so no further tests were made with it. Of the two light rifles, neither shot satisfactory groups "as issued." One of them responded to increased forend tension, but nothing done to the other seemed to have any effect.

Of six rifles tested, two gave satisfactory accuracy in factory condition. One was improved by "tuning" but none of the remaining three could be made to shoot acceptable groups. These tests were too limited to permit any definite findings, but from them I feel that certain TENTATIVE conclusions may be made:

1. Generally, very little can be done to improve the accuracy of the low priced .22 rifles. Their mechanical construction is such that they will not respond to the accuracy adjustments commonly made on high grade target rifles.
2. The use of match grade ammunition will not improve accuracy to any noticeable extent.
3. The quantity production methods used to manufacture these rifles is probably the limiting factor in regards to accuracy. These rifles are without exception made to a price, and the materials and design used will not permit fine accuracy adjustments.

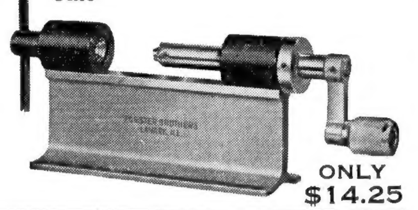
I would like to make a few observations in conclusion. From personal experience I know of certain individual rifles in this category that give excellent accuracy, but I believe they are the exceptions that prove the rule. For junior training and qualification programs, say Pro-marksman through the first Sharpshooter bar, these rifles are in most cases satisfactory. However, as the boy or girl progresses into the more difficult sitting, kneeling and standing positions, mediocre rifle accuracy is a definite handicap, and an investment in one of the high grade target guns is indicated. Furthermore, the abilities of our junior shooters in competition have reached a point that makes the use of a top grade target rifle almost mandatory in tournament shooting. The "tin can" rifles will fill the needs of small game hunters and casual shooters, but I believe a realistic appraisal will show them unfit for anything other than rudimentary instruction on the target range.

.222 REMINGTON VERSUS .222 REMINGTON MAGNUM

By Harold W. Harton

Like a lot of other gun-nuts, I felt like the .222 Magnum was an unnecessary gesture on the part of Remington and was probably brought out just to have something to talk about. Most fellows looked at the factory ballistics tables and said "what's the use in that thing." With only 3000 feet per second for a 55 grain bullet and the .222 standard at 3200 with a 50 grain bullet, I could

(Continued on Page Eighteen)



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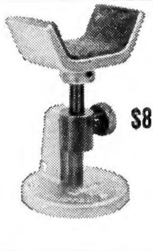

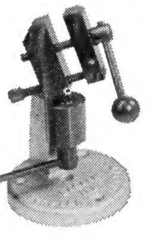

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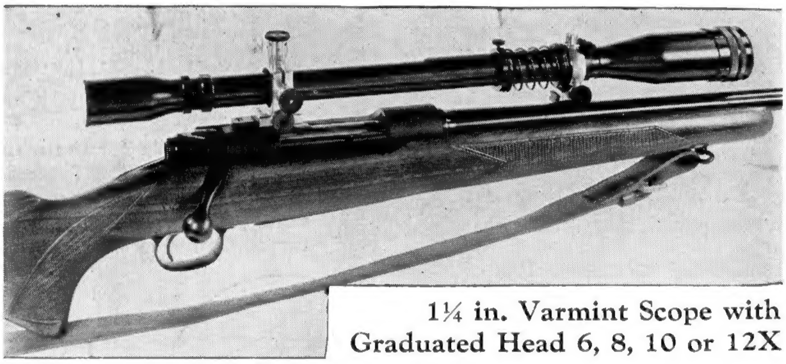

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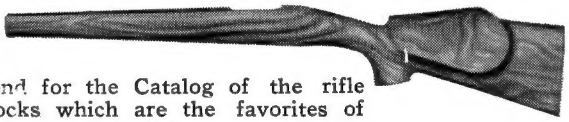

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.222 Remington Versus

(Continued from Page Seventeen)

see their (and my) reason for the cold shoulder. But being a non-conformist and highly inquisitive, I decided to make a little experiment and just see for myself whether or not there was really any merit for bringing out this new cartridge.

I had on hand a nice heavy barrel .222 Remington that was shooting very good; grouping ¾ inch at 100 yards for five shots, using 23 grains 3031 and the Hornady 50 grain SX bullet. At 200 yards the groups opened up to 1½ inches for the five shots and printed 3½ inches low. With these targets in file for reference, I then went back to the shop and rechambered the rifle for the .222 Rem. Magnum cartridge and returned to the range.

First, I fired at the 100 yard range, using the factory loads to sight in with. Then I switched to a handload of 27 grains of Hi-Vel No. 2 behnid the Hornady 50 grain SX bullet. This load I figured would be about the same pressure as the load of 23 grains of 3031 and 50 grain SX bullet in the standard .222 and would therefore be a fair comparison load. This Hi-Vel load printed in the same point of impact at 100 yards as the factory loaded 55 grain bullet load; 1 inch high. Then at 200 yards the impact was dead on.

This resulting flatness of trajectory was most surprising to me, in that it shot 3½ inches flatter than the standard .222 Rem. This is not according to most ballistic figures but was found out by actual shooting. I have always felt that the theory of shooting is a good way to start, but the actual shooting is the proof of the thing. Like bore sighting a rifle, it's a fine way to get on the paper, but you wouldn't want to go hunting with a rifle that had only been bore sighted. There are a lot of theories that will not work out in the field.

This flatness of trajectory is a very important factor in varmint shooting because just a slight miscalculation in range estimation could easily cause a miss, therefore the flatter the rifle shoots the less critical this estimation is. I have found out that this added velocity in this .222 Magnum makes shots easier than before. As anyone knows that does a lot of shooting of varmints like the buzzards and crows, they usually use pretty well the same trees and if you will keep this in mind as you approach them you can often get shots easier. I have noticed that shooting varmint type birds out of the same trees the .222 Magnum is more consistant than the standard .222 ever was for me. In fact this .222 Magnum **SEEMS** to be as flat as the .22/250. Of course we know it can't be, but the difference must be negligible.

The .222 Magnum has an advantage over the regular .222 of from over 400 f.p.s. with the 40 grain bullet to about 250 f.p.s. with a 55 grain bullet, and fellows, that is a fair advantage. There have been a lot of us change calibers or rechamber to an "Improved" cartridge for this much gain, or less. Therefore I say that the .222 Remington Magnum is a fine varmint cartridge in its own right and takes a back seat to none of them.

.357 CALIBER COLT'S

By Kent Bellah

Colt's three revolvers chambered for the powerful .357 Magnum cartridge are justly popular sporting guns. My experience with Colt fans is that they are the most loyal of all shooters to one brand name. The majority seem to consider

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all other guns as second rate, or worse. This applies to many skilled shooters, who point out the fact that Colt is the most popular name in big bore competition. They also stress that they can shoot and handle their favorite Colt better than any other gun.

This last statement leaves no room for argument. The best gun for anyone is the one they can shoot and handle best. Novice shooters often think whatever gun they own is best. You'll never know for sure until you give the top makes a fair test. This doesn't mean firing a box or so of ammo, but a regular workout with the make you are not so familiar with. I'd say 10 or more sessions are necessary, no matter if you shoot daily or weekly, with a minimum of 50 rounds (100 is much better!) at each session. If you are one of those unfortunate fellows who doesn't like to buy, try, and trade guns, no doubt you have a friend who will let you shoot his piece enough for a test, while he tries yours.

Of course you can be a "loner" if you desire, or if a shooting pal isn't available; I've had a lot of fun shooting, and nearly as much from the good companionship that often goes with it. With few exceptions, shooters and handloaders are the finest people on this green earth. Where else could you find such interesting people? If gunpowder had not been invented my life would have been dull indeed!

Colt's prestige revolver, the .357 caliber Python, is so beautifully fitted and finished that it shows up especially nice in this age of mass production. In recent years the public has accepted lousy workmanship fitting, and assembly on nearly everything from automobiles to zippers. Colt's deserve credit for maintaining high quality control. An officer friend, who was not a Colt fan, purchased a Pythron "just to look at" because it was such a nice looking gun he couldn't pass it up. After shooting it a while he started packing it in the line of duty. He said the 6″ tube was 2″ longer than he liked, but he had learned to handle the gun, and could hit with it so much better than with his old one that it was more than worth the slight inconvenience.

It's true that many policemen pack inexpensive service grade guns, and many departments still issue them, but the trend in recent years is to target grade revolvers. Some sportsmen prefer a 4″ barrel, and I think Colt's would do well to supply the Python with either a 4″ or 6″ tube. Colt's flatly call it "The finest revolver made." I have not yet met one Python owner who did not agree!

Colt's "Three-Fifty-Seven" is a lower priced, quality, target grade revolver. Mechanically it's identically to the Python, and the price makes it much more popular. The very fine finish on the Python adds much to the cost, and perhaps nothing to the shooting. The lower priced brother has a fine, long-lasting "standard" finish, not quite so highly buffed. The lockwork and fitting are excellent, with indications of some skilled hand fitting, and on the several guns I've examined, I believe it's equal to the Python.

The Three-Fifty-Seven does not have the Python's integral ventilated rib barrel, or ejector rod housing, features many shooters do not want or need. Either gun will stay in the ten ring all day, every day, and the average fellow will find that his groups with one are as good as with the other.

The Three-Fifty-Seven has the same sturdy click adjustment rear sight. Chamber alignment is excellent. Bolt cuts are correctly positioned, and when you pull the trigger and hold it back, you'll find there is practically no play whatever in the cylinder. Colt's floating firing pin in the frame is an excellent feature. It prevents primers from flowing into the firing pin hole and locking the cylinder. I've had this grief with guns that have the firing pin on the hammer, using my own handloads that are hot, but not excessive, using some makes of primers, and with various Lot Numbers of standard factory ammo.

In one lot of factory ammo, Super-X 57 NC3, over half the cartridges in the 5 boxes I used, and some used by friends, tied-up our guns with firing pins on the hammer. It required two hands and some work to free the cylinder, shearing off the primer in the firing pin hole. The ammo functioned perfectly in my Python and Three-Fifty-Seven, as did other lot numbers that gave this trouble.

The Pythron is standard with full checkered walnut target stocks and target hammer. The Three-Fifty-Seven is available wtih service or target type stocks, and with either hammer. The wide target hammer is certainly worth the small extra cost for rapid single-action work. Hunters can cock and shuck out lead extremely fast on still or running varmints and game. Plinkers can shoot fast enough to blast two or more aerial targets in single-action fire.

Hunting and plinking brings out the ultimate skill in practical handgunning. A little regular practice will make you a much better hunter and plinker than competitive shooters who get smaller groups on paper. The Three-Fifty-Seven is a dandy gun for this purpose. You have a choice of a 4″ or 6″ tube. Colt's service stocks, like other service stocks, are not very good for sporting use for me. I always recommend target type stocks.

Colt's best known gun of all time, the famous Single Action Army, is now supplied chambered for the .357 Magnum cartridge. No doubt this will be far more popular than the same model in .45 Colt or .38 Special, as the price is no higher. Many good shooters who have handled handguns all of their life swear in good faith that no better handle has ever been put on a gun, nor a gun made with better balance and "feel." I won't argue these points.

There is no need to describe the gun. More people know more about it than any other. The .357 caliber must be made of better steel than the .38's, as it takes my hottest handloads without complaint. It also has a firing pin that is an improvement over my .38 Special caliber. My barrel is the neat 4¾″, and you can have it with a 5½″ or 7½″ if desired. Checkered black rubber stocks are standard, or genuine walnut for $5 extra.

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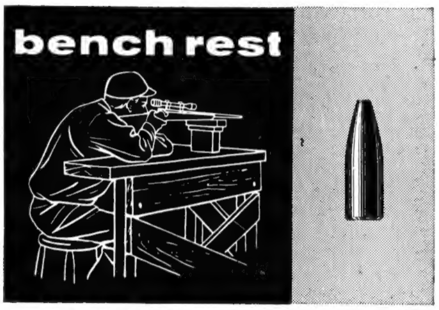

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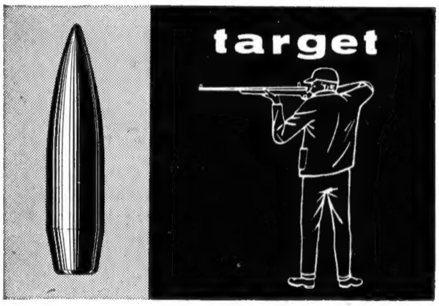

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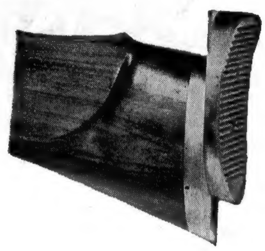

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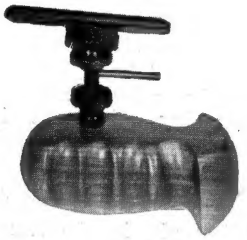

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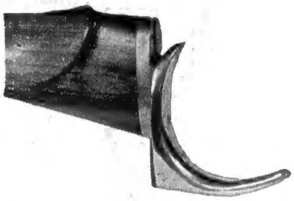

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